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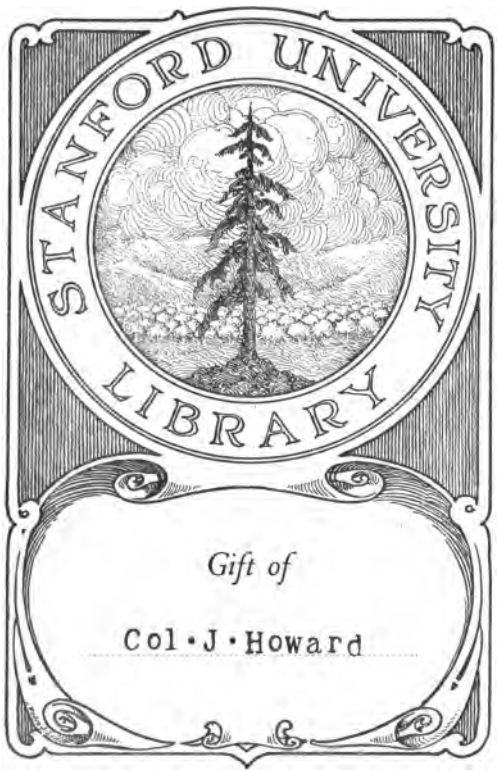
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MAP MANEUVERS

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Revised Edition

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ADDENDA

GERMAN WAR GAME MAPS

The German General Staff has recently published a new war game map called "Bückeburg-Springe-Hannover," which is highly recommended. It is in several colors and the scale is 1:10,000. It consists of 168 sheets and may be obtained, each sheet mounted separately on card board, thru the American military attache at Berlin, for about $22.00. A number of copies of the guide map, scale 1:100,000, are furnished with the map.

The maps of frontier districts, which have been chiefly used hitherto, have been found to lead to a certain monotony in the problems which is undesirable, and it is noticed that the latest German war game maps are not of frontier regions.

The scale of the Bavarian war game map "Dachau" is 1:8,000; it consists of fifty-six sheets, and may be obtained from Hubert Köhler, Blüthenstrasse, No. 13, Munich, Bavaria, for about $13.00; the guide maps are sold for 25 cents each. The "Landshut" war game map is no longer to be had.

An addition of sixty sheets is to be made to the Feistle war game map "Metz" during the present year (1908), extending it westward into French territory. New guide maps for the Feistle map, one meter square, scale 1:100,000, are also being prepared.

The continued activity in the production of German war game maps is remarkable; but it is noticed that the smaller maps ("Schweidnitz", "Landshut", etc.) are being discarded.

FRENCH WAR GAME MAPS

The large scale maneuver maps in most common use in the French army are 1:8000 and 1:10,000 scales, and are ten or eightfold enlargements of portions of the état-major map of France (scale 1:80,000). They are not contoured and show slopes only by hachures.

AUSTRIAN WAR GAME MAPS

There are six maneuver maps in use in the Austro-Hungarian army, named Trautenau, Poisdorf, Jicin, Wisikow, Grodek and Goerz. The scale of the first four named is 1:7500

(about 8½ inches to 1 mile) and the scale of the two others is 1:12,500 (about 5 inches to 1 mile). A peculiar feature of the "Grodek" map is that all names are omitted from it; this seems logical, for the maneuver map is to be regarded as the maneuver ground, and this arrangement compels officers to refer to their guide maps to learn the names of localities.

Austrian maneuver maps, with guide maps (scale 1:75,000) and general maps (scale 1:200,000) of the same regions, can be obtained from the Austrian Military Geographical Institute, by applying thru the American military attache at Vienna. The maneuver maps consist of from ten to twenty sheets each and are sold at about 20 cents per sheet. The "Jicin" and "Trautenau" maps are especially interesting, as they represent the scenes of important engagements between the Austrians and Prussians in the War of 1866.

THE WAR GAME IN THE AUSTRIAN ARMY

Orders from the War Office direct that all officers and cadets of the Austro-Hungarian army receive instruction in the war game. This instruction is given from about the middle of November to about the 1st of March in each garrison, under the supervision of the senior officer present or of a specially selected officer. About three hours a week are devoted to this work. (Major W. H. Allaire, January, 1908.)

INTRODUCTION

The soldier, unlike other professional men, has no opportunity, ordinarily, to practice his profession. Modern wars are short and infrequent, but involve enormous cost in blood and material resources. The outbreak of war must find the soldier already familiar with his work. There will not be time enough after the outbreak of war for him to learn his duties before military operations begin; and the cost of permitting him to learn by experience derived from his own blunders is too great to be considered.

A man can acquire familiarity with his work only by experience; theoretical instruction alone does not suffice. As wars have become more infrequent, the necessity of giving soldiers practical training in the operations of war in time of peace has increased. It was formerly supposed that a knowledge of the art of war could be gained only in war; but experience has shown that armies can be trained more effectively in peace than in war. Modern armies are composed of peace trained soldiers. The most efficient armies of the world are composed of men who have never engaged in war. The effectiveness of modern armies is judged by the efficiency of their field maneuvers.

"It has long been recognized that mere 'barrack yard drill' is not a sufficient preparation for war; and it is a mere statement of an axiom to say that troops should be assembled as often as may be practicable in large bodies and required to act under conditions assimilated as nearly as possible to those of campaign and battle. There are many things that cannot be

learned by the most intelligent and diligent student of books, which are readily acquired in practice on the field. The formulation of orders, the arrangements for marches, scouting and reconnaissance, and the deployment of forces for battle can be conducted in peace maneuvers almost exactly as they would be in the serious business of actual war." (Report of Maneuvers of 1903, by Colonel A. L. Wagner.)

In a field maneuver, troops are handled in accordance with the requirements of a military situation which is more or less imaginary. A state of war is assumed to exist, and certain suppositions are made with reference to the mission of a body of troops and with reference to the information which its commander possesses of the enemy and of his supporting troops, which make the performance of certain military operations incumbent upon it.

But the time, troops, and maneuver grounds necessary for field maneuvers cannot be obtained often enough to give officers all the practical experience they need, and additional expedients are employed to extend the amount and variety of this practice. Officers are sometimes designated to command imaginary bodies of troops with others as their staff officers or subordinate commanders. The imaginary troops are then conducted over actual ground by means of such orders and messages as would be used if the troops were real, a record being kept of the supposed positions of the imaginary troops by means of pencil notes. Exercises of this kind are called tactical rides; they may take a greater variety of forms than field maneuvers, for the reason that there are fewer actual conditions to hamper them.

When the use of actual ground is not practicable, on account of bad weather, lack of transportation, or other causes, the ground may be supplanted by a

map; and maneuvers may be conducted on the map in much the same way as field maneuvers and tactical rides. These exercises are called map maneuvers or war games. Map maneuvers do not constitute an art or science apart from the art of war. The maneuvers conducted by this method could be carried out in the field with troops if time, troops, and ground were available. We merely substitute a map for the ground and blocks or pins for the troops; nor is any special knowledge—except of map reading—essential in order to conduct maneuvers on a map, which is not also essential in conducting field maneuvers.

It is apparent that by this means opportunities for practice in maneuvers may be greatly extended. Maneuvers with troops are restricted to certain seasons of the year; they give practice in forming decisions and issuing orders to a few officers only; and restrictions in regard to the ground and troops available often limit the number and value of the lessons which can be drawn from them. Map maneuvers, on the contrary, may be carried on at all seasons; may be extended and varied so as to give many officers opportunities to exercise command; present no difficulties in employing any number or kind of troops; and may be conducted on any ground of which we possess a suitable map.

On first taking up exercises of this kind, a doubt may exist in the minds of some as to whether the operations of war can be represented on a map with sufficient accuracy to enable military students to derive lessons of practical value from them. Representations of military operations on a map may be made more faithful in some respects than those conducted on actual ground with troops. We hesitate, in our field maneuvers, to require the men to undergo the fatigue and other hardships incident to war; and our maneuvers are usually conducted

either on military reservations where normal conditions do not exist, or on ground which we are not permitted to use as we would do in war. In map maneuvers, on the other hand, we dig trenches, blow up bridges, burn towns, march troops over private grounds, and require them to make the exertions, undergo the hardships, and suffer the losses that must be expected in war.

The effect of fire can be taken into account more accurately in map maneuvers than in field maneuvers. For instance, it may happen in a field maneuver that a battalion of infantry, advancing in column of squads, is fired on at 2500 yards by a battery which has learned the range, and the battalion continues to advance in this formation—not knowing that it has been fired on—and thus gains ground to the front too quickly. Such incongruities can be avoided in map maneuvers and a reasonable allowance always made for the effect of fire, because the director is better informed and has more perfect control of the exercise.

Field maneuvers with troops form an indispensable part of an officer's training; they cannot be entirely replaced by exercises without troops; but officers who have had the most experience in handling troops are most readily interested in map maneuvers and are able to derive the greatest benefits from them, while officers who have seen troops handled but little, find difficulty in conducting map maneuvers and even in participating in them as commanders.

Tactical rides do not impose so great a strain upon the imagination as map maneuvers and have the advantage of requiring a study of actual ground; but they are at the mercy of the weather and cannot be conducted so easily and rapidly as map maneuvers.

CHAPTER I

UTILITY, ORIGIN AND DEVELOPMENT

UTILITY

Every operation of war, from patrolling to the conflicts of great armies, can be represented on a map, and tho there are certain limitations, map maneuvers are of the greatest value to the practical military student:—

1. In supplementing field maneuvers and tactical rides, thus giving officers increased opportunities for practice in conducting maneuvers, and in forming the decisions and issuing the orders incident to the command of troops. An exercise of this sort is conducted by a director or umpire, officers being designated to command opposing bodies of troops, in accordance with a pre-arranged situation, and in a manner similar to a field maneuver. In some cases one force only is represented, the enemy being outlined or imaginary.

2. As a means of analyzing military situations and of testing the tactical measures suggested by them, map maneuvers are useful as an aid in devising military problems and in preparing solutions for them. In this form of exercise one or two officers work alone at the map. Umpires are not required and formal methods are dispensed with.

3. As a rapid method of conveying instruction in tactics, the instructor may propose problems and then solve them himself in the presence of students, the movements and positions of troops being represented on the map. The opinions of the students

as to the measures which should be taken may be invited, and instruction may be given by means of a conversation in which all of the students take part. This method is well exemplified in an article entitled "Une Manœuvre sur la Carte" in the March, 1907, number of the Revue Militaire Generale.

4. The methods of representing the movements of troops on a map are useful as an aid in the study of military history. This is exemplified by the "Studies of the Battles of Colombey-Nouilly and Gravelotte", by Sir Lonsdale Hale.

5. Map maneuvers furnish an excellent means of familiarizing officers with military geography. It is a significant fact that most of the war-game maps used by the Germans are of their frontiers—the ones most used being of the country bordering on France.

6. Map maneuvers also afford practice in map reading and in computations of the elements of time and space involved in military operations—practice of the greatest benefit to all officers.

The German army has made greater use of map maneuvers than any other, and the results of its experience merit our attention; their Field Service Regulations say: "The war game, tactical problems, lectures, winter essays, and tactical rides all contribute to the mental training of officers. *The war game and tactical problems* awaken interest in the study of regulations, of tactics, and of military history, and afford opportunities for practice in forming decisions rapidly. In order to be beneficial, however, they must be conducted skillfully—by an officer specially fitted for it, selected without regard to length of service". (Par. 11, Introduction, F. D. O. 1900). From the fact that the war game is here mentioned first among the factors of an officer's mental training, Meckel argues that it is regarded as the most important.

The greatest benefit to be derived from map maneuvers lies in the training which officers receive in forming decisions promptly, in issuing orders, and in writing messages and reports. Young officers may obtain thru map maneuvers instruction and practice of this kind which they would not get in any other way. "The power of rapidly grasping a situation, of being able quickly to come to a decision and at once issue clear and easily executed orders, more than the possession of any other faculty, brings success to a commander in the field. The development of this faculty ought to be the main objective of the training of combatant officers in peace." (Haig.)

To officers who have spent years in subordinate grades without opportunities for exercising independent command, map maneuvers may bring an increased interest in their profession and a higher respect for it, by giving them opportunities to handle on a map the three arms combined in contact with an enemy.

Maneuvers should go hand in hand with theoretical military instruction. Purely theoretical instruction applies only to general cases,—its rules and principles are only indications, totally insufficient for special and exceptional cases. In maneuvers an officer has opportunities to apply principles which he has learned and test their value. Theoretical instruction in military art has but little value if the student cannot utilize it; and it is only by the practical application of such knowledge that he can gain facility in its use.

As a practical means of keeping the commanders of large bodies of troops informed of the military situation, and of the location of all parts of their commands, the methods of map maneuvers have a practical application in field maneuvers and in war. A hundred years ago Napoleon Bonaparte worked out

the details of the concentration and deployment of his armies by maneuvering colored pins over a map of the theater of operations; and successful generals of the present day, notably the Japanese, are said to have used similar methods.

Some of the large business houses of this country keep in the office of the manager a large map of the United States on which are blocks bearing the names of their traveling agents, the blocks being moved daily to show the location of the agents; when the manager wishes to have business attended to in any part of the country, he has only to glance at the map to get the address of his nearest agent and can telegraph instructions to him without delay.*

All are familiar with the methods by which train dispatchers keep informed of the location of trains—a method which is said to be used by the Army Transport Service to show the location of transports.

The recent development in the efficiency of our signal corps indicates that in future a commander will be able to communicate with all parts of his army more directly and more promptly than has hitherto been thought possible. In order to derive the full benefit from this improved means of communication the commander must keep himself constantly informed of the location of his troops. In the case of large forces this can be done only by representing troops on a map—by some such method as those used in map maneuvers.

ORIGIN--WAR CHESS

The game of chess is the oldest form of war game, and modern map maneuvers have grown out of the game of chess by a long process of evolution.

* A system of state maps showing railroads, and colored tacks to show the location of traveling salesmen is sold by John W. Iliff, 350 Wabash Ave., Chicago, Illinois.

In the latter part of the eighteenth century war was taught in Prussia as an exact science—a branch of applied mathematics resembling geometry. Von der Goltz says, "A true strategist of that epoch did not know how to lead a corporal's guard across a ditch without a table of logarithms" (page 287, Rosbach et Jena, V. der Goltz).

In 1780, Helwig, a master of pages at the court of Brunswick, invented a modification of the game of chess for the purpose of illustrating the principles of war. The pages under his charge were young noblemen destined for the military service, and the game was invented as a means of interesting and instructing them in military science. Helwig said of it in a letter written in 1781: "Numbers of military men, profound in the theoretical and practical science of their profession examined it; * * * they recognized in it a very efficacious means for attracting the attention of young men destined for military service, creating in them a taste for the service, and lessening the difficulties of instruction."

The game was played on a board divided into 1,666 small squares tinted in various colors to represent different kinds of ground, villages, lakes, etc. Troops were represented by pawns similar to those used in chess; all the pieces represented either battalions of infantry or squadrons of cavalry. They moved and fought according to fixed rules similar to those of chess. Squares in opposite corners of the board represented fortifications, and the object of the game was to capture the fortress of the adversary.

Helwig's game was a great success; it attracted favorable comments everywhere and was introduced into France, Austria and Italy. A number of imitations or variations of it appeared, among which may be specially noticed one invented in 1797 by Ventur-

ini, a writer on the science of war. Of it Von der Goltz says: "It resembles very closely the game of *'poste et de voyage'*, in vogue a few years ago, in which, upon making an unlucky throw of the dice, one tumbles into a swamp, or breaks an axletree, or experiences some other such mishap. * * * This war game is a bad product of the refined military education of the period, which had piled up so many difficulties that it was incapable of taking a step in advance."

All of the war games of this period may be designated as war chess. They probably illustrated the science of war, as taught at that time, better than it could have been represented on a map or on the ground.

WAR GAME

The credit of originating the war game is commonly given to the Prussian War Councillor von Reisswitz, a civilian, who in 1811 invented a game conducted on a terrain modeled in sand, troops being represented by blocks of wood. This game attracted the attention of the king (Frederick William III) and Von Reisswitz made for him an improved form of it, in which the terrain was modeled in relief in plaster, —woods, villages, roads, and water courses being shown with colors. The king was greatly pleased with it and matches at this game were quite popular at his court.

The honor of originating the war game should, however, be given to Lieutenant von Reisswitz, of the Artillery of the Prussian Guard, a son of the Von Reisswitz previously mentioned. This officer conceived the idea of adapting the game devised by his father to the details of actual military operations, thus making practical utility to military men its primary object.

With the assistance of other officers, he framed an elaborate system of rules, which were published in 1824 in a work entitled "Instruction for the Representation of Tactical Maneuvers under the guise of a War Game." It was a great step forward in that the exercises were to be conducted on maps, and that any military situation could be represented.

This game was received with marked favor by the most distinguished Prussian officers. It is told that in 1824, Von Mueffling, then Chief of the General Staff, consented to witness an exhibition of the game. He received the players somewhat coldly, but as the operations expanded on the map, the old general's face lit up, and at last he broke out with enthusiasm, —"It's not a *game* at all, it's a training for war; I shall recommend it most emphatically to the whole army."

He kept his word, and a letter written by him which appeared in the "Militar Wöchenblatt" in March, 1824, may be said to be the formal introduction of the war game to the Prussian army. Among other things he said: "Whoever understands the art of war can, in this game, perform the functions of a commander of troops * * even if he * * has never seen the game played. By practicing on good maps representing a real terrain, and changing them, it becomes the more instructive, because it permits a variation in the dispositions to be made and the orders to be given. I shall endeavor by all means at my disposal to increase the number of maps now existing."

The king directed that each regiment be supplied with one of these games and Lieutenant von Reisswitz was employed to superintend the preparation of the new maps. The maps which he used were on a scale of 1:8000 and were as complete in details as they could be made. The troops were represented

by blocks cut to the scale of the map and painted, red for one party and blue for the other, and showing by conventional signs the strength and arm of service of the organizations represented.

The exercises were begun by giving to the commanders general and special situations in writing, and requiring them to prepare written orders. It was carried on in "moves" of two minutes each, but when the opposing parties were not in contact the umpire could order several moves to be made at once.

It is apparent that this exercise had many excellent features and, no doubt, reflected the more rational views of the art of war which followed the Napoleonic era. Its weakness lay in its numerous and detailed rules, which demanded long preparation on the part of the umpire and confined the operations within narrow limits. All decisions were made with the aid of dice, from which it resulted that the most carefully planned combinations would fail if the dice did not favor them. The remarks of Von Reisswitz on this subject are worthy of note: "It is not a question of winning or losing as in cards or chess, * * the approbation of one's comrades is the only possible reward. Whoever follows out his plan best, adopts the simplest and most natural means to the end, and departs least from the general idea of the operation, will have won the match, even tho he may have lost more pieces than his adversary. * * The advantages they will derive from it will be to acquire skill in reading maps, in the selection of movements best suited to the different arms of the service, in the choice of positions, etc. The interesting discussions which are sure to follow a match will be of incontestable value in the study of the military art."

The war game retained in its main features the

form given it by Von Reisswitz* for half a century, and many of the changes made during that period were not improvements.

In spite of the interest with which it was at first received and the favor with which it was regarded in the highest military quarters, it did not soon attain the popularity which was expected. It was not in general use in the Prussian army until 1860, tho it was kept up by clubs in some of the larger garrisons. The members of the Magdeburg Club (of which Von Moltke was manager), of the Berlin Club, and the officers of the artillery of the Prussian Guard are mentioned as being specially expert during this period.

In 1828 Von Moltke, then a lieutenant, was an industrious player, and later, as chief of staff of the 4th Corps, exerted his efforts to promote the game, which he considered the best means of imparting military instruction. When he became Chief of the General Staff in 1857 he took steps to extend it thruout the army.

The prominent defect of the game was the slowness and difficulty with which it was conducted, owing to the great number and complicated character of the rules and tables employed, which destroyed interest in the exercises. Not only did they render the game difficult but there was a tendency to include particulars under general rules which often destroyed the accuracy of the result. Several able works on the subject were published during this period,—notably those of Decker and Witzleben and one published by the Berlin War Game Club in 1846. Rules relating to the estimation of the effects of fire were completed and assumed greater importance;

* The attention which Von Reisswitz received excited the jealousy of other officers, and this resulted in his being transferred from the Guard and sent to a frontier fortress (Torgau). Disheartened by this injustice, he committed suicide there in 1827.

the rules became more numerous and complicated and the practice of the game became more difficult.

The work of Von Tschischwitz which appeared in 1862 made some improvements in the way of less complicated rules and more practical methods of computing losses. The work of Von Trotha, which appeared in 1869, added a number of new rules and increased the difficulties.

No war game rules of this period give the data upon which they are founded, but there is reason to believe that the tables are almost purely theoretical and not based on the results of experience.

At the conclusion of the wars of 1866 and 1870-71, German officers qualified by experience to form opinions on such a question agreed that the war game as then conducted did not represent the varying circumstances of warfare in a satisfactory manner. The rules were already far too voluminous for convenient use, yet would demand great extension in order to obtain correct results.

Meckel says: "After the war, when military ideas ran into more practical channels, when a general desire for practice and training in troop leading existed, and the war game was encouraged by imperial decree, it received a new, extraordinary, and universal enthusiasm,—which, however, is not to be attributed to the old systems with their complicated rules, but which rather existed in spite of them. It is a question whether in the German army there was a war game played in strict conformity with the rules. The exercises, under the leadership of officers of high rank who had no liking for the old systems, cut loose more or less from the cast iron rules and assumed, under a free leading, the form of serious exercises in the leading of troops." (Anleitung zum Kriegsspiel, Meckel, revision of 1904.)

Efforts to eradicate the defects of the game took

two different directions, and resulted in two varieties of the game, called "Rigid" and "Free," respectively. Those who followed the "Rigid" method studied and tabulated the results of experience—particularly from the records of the wars of 1866 and 1870-71. They endeavored to make the rules and tables accurate, and then to systematize them so that they could be more readily used.

Perhaps the best known of them is Capt. Naumann, whose work entitled "Das Regimentskriegsspiel" appeared in 1877. His work contained some marked improvements in the mechanism of the game, but his system was still so complicated that few would have the patience to put it in practice. Captain Naumann originated the idea of selecting a standard case and deducing from it, by applying a suitable multiplier, the result to be expected in any particular case. An explanation of his method is to be found in our "Provisional Instructions for Maneuvers" (1904—Par. 40.)

The work of Major Livermore, U. S. Corps of Engineers, called "The American Kriegsspiel," is based mainly on the system of Naumann but it is a great extension of that system and in many respects an improvement upon it.

Many more influences are taken into consideration by Major Livermore, and the game is thus rendered more flexible and a closer approximation to the conditions of war. Tables expressing the value of these influences are more logically and compactly arranged and a more rapid method of computation devised, in which logarithms are used to facilitate the numerous processes of multiplication required. Dice are used to fix the value of influences which are uncertain or concerning which no data can be obtained.

Major Livermore also devised an ingenious system of blocks, which not only represent troops to the

scale of the map, but also show the condition of each unit in regard to fatigue and the losses which it has sustained,—and thus obviate the necessity of keeping the cumbrous records which were formerly thought indispensable.

It may be confidently stated that Major Livermore's system is the best of its class; but it can not be readily and intelligently used by any one who is not a mathematician, and it requires, in order to be able to use it readily, an amount of special instruction, study and practice about equivalent to that necessary to acquire a speaking knowledge of a foreign language.

MAP MANEUVERS

The evolution of modern map maneuvers from the old war game may be dated from the publication of three important works in Germany—thru which a new system was continuously and progressively unfolded.

These were "War Game Studies," by Lieutenant Meckel, an instructor in the war school at Hanover,—published in 1873; "Instructions for the War Game," by the same author, published in 1875; and "A Contribution to the War Game," by Colonel von Verdy du Vernois, then Chief of Staff of the 1st Army Corps,—published in 1876.

Meckel's "War Game Studies" consists in great part of a demonstration of the usefulness of the war game as a means of imparting military instruction; and is a spirited plea in its favor, pointing out the necessity for a change in the manner of conducting it.

His "Instructions for the War Game" emancipate the director from rules in conducting the exercise but require him to consider the effect of fire—to be determined by the use of tables and dice. A revision of this work by Captain von Eynatten has appeared

recently (1904) in which the tables of fire losses are omitted.

It was Meckel's intention to follow the "Instructions for the War Game" with a description of a concrete case, illustrating his view as to the manner in which an exercise should be conducted; but Von Verdy's "Contribution to the War Game" appeared shortly afterward containing a description of a concrete case which met Meckel's view so fully that he gave it his unqualified approval and did not complete his own.

Von Verdy's work has been known in this country since 1897 thru the translation by Major Eben Swift, entitled "A Simplified War Game."* Von Verdy made a more radical departure from the old methods than Meckel had done. He abandoned entirely moves of set length and the use of tables and dice—leaving the conduct of the exercise and all decisions to the judgment of the director.

It is apparent that by this system great responsibility is thrown upon the director, and the difficulty of obtaining sufficiently qualified directors has been urged as an objection to the system. Major C. W. Raymond, Corps of Engineers, U. S. A., says: "I think its inherent weakness is indicated in a sentence on the first page of Von Verdy's 'Contribution to Kriegsspiel'; a book written with the avowed purpose of advocating its employment. Having remarked that in spite of the general recognition of the utility of Kriegsspiel the attempt to carry it on is often abandoned, the writer says, in seeking a reason for this, that he has in most cases received the answer, 'There is no one here who understands how to conduct it rightly'. If this be true as regards the old Kriegsspiel with its tables and copious instructions, what must be the case when the director is thrown upon

* Published by Franklin Hudson Pub. Co., Kansas City, Mo.

his own knowledge for guidance in his decisions. However possible such an exercise may be in Germany, it will certainly be found generally impracticable in our own country. In Berlin, where there are officers of the General Staff, who devote their undivided attention to the study of the art of war, it may be possible to obtain competent directors * * but in this country * * only in a few exceptional cases would it be possible to obtain a director, the superiority of whose experience and attainments would be so undoubted that his decisions would receive unhesitating acceptance. * * * My own experience as a director has convinced me that * * * the director, after he has conducted a few exercises, finds inevitably that he is acting in accordance with rules which he has consciously or unconsciously formed. Thus the choice we have to make is not between rules and no rules, but between rules based upon the careful study of all available data, which have stood the test of practice and the fire of criticism, and rules extemporized by a single authority, to be accepted without demonstration, and to be varied by every new director." (Kriegsspiel, by Captain C. W. Raymond, C. E.)

Major Barth says of Free Kriegsspiel, "Where competent umpires can be obtained, this system will do passably well. But, to fill the position acceptably, the umpire should have had extensive experience in modern war and should have mastered its teachings so as to apply them in making his decisions. It at once becomes apparent that men whose dictum would be received without question are few in number in any country, and especially so in our own. * * * As it is admitted that fire action will be the leading factor in deciding encounters of every kind except cavalry charging * * *, every effort should be made to ascertain what the resulting losses will be." (Ma-

neuvers and Kriegsspiel, Vol. XIII, Journal, M.S.I.)

The opinions of these able officers, based as they are on study and experience, compel respect. But Rigid Kriegsspiel has been found by the Germans, who have given it a thoro trial, to be too great a strain upon the patience; and we have less patience than the Germans. Efforts to introduce Rigid Kriegsspiel into our army have not been attended with success. Von Verdy's system has stood the test of practice for many years and is the only system in general use today. Recent publications on this subject by German, French, and British authorities follow Von Verdy in all essential particulars.

The officers of foreign armies derive both pleasure and profit from maneuvers on the map—conducted by this method; and, since a more general interest has been aroused in the study of military art by our garrison and service schools, it is believed that such exercises will prove interesting to our officers as well, and that less difficulty will now be found in obtaining competent directors. Difficulty also exists in obtaining good umpires for our field maneuvers, but it is not to be supposed that field maneuvers will be discontinued on that account.

We have many officers who are able to conduct field maneuvers in such a manner as to make them interesting and instructive to all concerned; and the same officers (if familiar with map reading) would make excellent directors in map maneuvers conducted by the Von Verdy method. Even if the director should make decisions, as to the effect of fire, etc., which appear erroneous, the exercise is not necessarily rendered unprofitable.

In Rigid Kriegsspiel the value of the undetermined factors is fixed in each particular case by throwing dice. Suppose that in an exercise at Free Kriegsspiel the director decides an attack to be

repulsed when a more thoro examination of the conditions shows that it would probably succeed: the same decision might have been reached by the methods of Rigid Kriegsspiel if the dice did not favor the attack. The decisions of a director can not be more erratic and unexpected than are the actual events of war.

Map maneuvers, as well as field maneuvers, should always be followed by a full discussion: by this means erroneous decisions will usually be detected and their evil effects eradicated.

In a recent essay on the subject of "Maneuvers and the Duties of Umpires," Colonel Livermore recommends that umpires at field maneuvers should use tables and computations similar to those to be found in his work, "The American Kriegsspiel"; and, indeed, it does appear that they are quite as necsary to field maneuvers as they are to map maneuvers. On this point Colonel Wagner's report of the field maneuvers of 1903 at West Point, Ky., and Fort Riley, Kas., says,—"A table of losses was carefully prepared for the use of the umpires. Such tables, while very valuable in a game of kriegsspiel*, are of but little account in maneuvers in the field * * * in most cases, the action moves so quickly that the umpire is compelled to make his decisions instantly, without time for referring to a table, and the best that can be done is to endeavor to rectify any mistakes that may thus be made when the problem is finally discussed."

The objections here stated to precise computations of losses apply also to map maneuvers; for the delay caused by such computations would rob the maneuvers of their interest; and, since the time available for these exercises is always limited, would

* The Kriegsspiel referred to here is, of course, *Rigid* Kriegsspiel.

often prevent them from being developed sufficiently to be instructive.

Free and Rigid Kriegsspiel have tended to approach each other in recent years. In the last edition (1898) of Colonel Livermore's work, he says,—"It cannot be too strongly stated that * * * computations not only need not, but must not, be made in every case. They are intended to facilitate and hasten the game, and should not be so perverted as to retard it. The reduction in the rate of march can almost always be estimated; only the important factors should be considered in modifying the effect of fire; unimportant fires should be neglected; the fatigue may be neglected until the players show a disposition to force the troops; * * * and the loss of ammunition need only be expressed when there appears to be difficulty about replenishing it." (p. 26, American Kriegsspiel).

Major Raymond says,—"We find the writers on Free Kriegsspiel occasionally admitting that rules and tables may sometimes be useful; and on the other hand, the advocates of Rigid Kriegsspiel generally begin with the statement that these rules and tables are intended to be merely of an advisory character and that the director should proceed without them whenever his personal knowledge suffices for the occasion. The distinction between the two systems is, indeed, largely one of degree; yet it is sufficiently marked to justify its recognition." (p. 3, Kriegsspiel.)

Data in regard to the effect of fire, rates of march etc., etc., are of interest and value to all officers, especially to those who expect to act as umpires at maneuvers, but the practice of referring to such data during the progress of a maneuver—either in the field or on the map—has been universally discontinued.

In the German army these exercises are carried on at the headquarters of each regiment and detached

battalion under the name of the "regimental war-game" (das regiments kriegsspiel); they are obligatory and one evening per week during the winter months is devoted to them. The regimental war game is conducted on maps of scales from 1:5000 to 1:8000 (12 to 8 inches to the mile) and includes maneuvers in minor tactics and the operations of detachments composed of all arms up to the strength of a brigade. The older officers of a regiment and the lesser staffs (corps and division) carry on tactical maneuvers called "Great Kriegsspiel" in which maps of a scale of 1:10,000 (6 inches to a mile) are ordinarily used and which include the operations of divisions. In addition a "strategical war-game" is carried on by the General Staff, which is intended mainly for the instruction and training of staff officers;—for this, the general staff maps, scale 1:100,000 (about $\frac{2}{3}$ inches to 1 mile) are used.

INTRODUCTION IN OTHER ARMIES

After the war of 1866 the war game was cultivated extensively in Austria, and the war of 1870-71 opened the eyes of all Europe to its importance. In 1872 Captain Baring of the Royal Artillery prepared for the British service a set of rules based mainly on the work of Von Tschischwitz. In his preface Captain Baring says, "The increased importance which is now attached to the game may be, in some measure, due to the feeling that the great tactical skill displayed by the Prussian officers in the late war had been, at least partially, acquired by means of the instruction which the game affords." The work of Captain Baring was used as a guide in this country for many years, notably at West Point where the game was played a great deal.

Captain Shaw conducted in England in 1877 a war game on a terrain modeled in relief in plaster

on a large scale (1:720). The war game was officially introduced into the British army by the Duke of Cambridge in an order dated October 3, 1883. A pamphlet entitled "Rules for the Conduct of the War Game on a Map," was published officially to the British army in 1896. A later edition of these "Rules" was published in 1899. Rules for the conduct of the war game are now incorporated in the British Field Service Regulations (Combined Training). The war game is not compulsory in the British army, but is kept up voluntarily by "Kriegsspiel Societies" in each military district.

The war game was first introduced in our army in 1867, and was taken up by our navy in 1886.

In Italy, instructions, based mainly on the work of Von Trotha, were published by the General Staff in 1873, under the designation "Maneuvers on the Map," as they are officially called. Map maneuvering is a part of the professional examination for the grade of captain and field officer.

Kriegsspiel was introduced in France in 1874 and for a time acquired a certain vogue in several army corps; at the garrison of Besançon two war games were kept up during the winter of 1874-5 and at Paris war games were frequently held. They were definitely taken up as a means of instruction at the French War College in 1889. Ministerial instructions relating to map maneuvers (Exercices sur la Carte) were issued February 20, 1895, but did not make them obligatory except in the staffs. Major Ch. Henrionnet, writing in 1898, says that after a few years of half-hearted and isolated efforts the war game had fallen into disuse in the line of the army and was then scarcely known in France outside the War College and the staffs. Map maneuvers were made obligatory in regiments and garrisons in April, 1900, and improved methods of conducting them, de-

veloped by experience at the War College, have been extended thruout the army.

In Austria map maneuvers have been made obligatory; officers are required to take part in them twice a month during the winter season—from the first of December to the end of March.

In Russia the exercise is practiced extensively.

The war game was introduced in the Japanese army by General Meckel. Japanese translations of the works of Meckel and Von Verdy are used by the Japanese officers. Great stress is laid on the value of the war game as a means of instructing officers thruout the Japanese army,—especially in the Japanese War College.

RECENT DEVELOPMENT

Von Verdy's system aroused a great deal of opposition at the outset, but it has steadily gained ground until it has replaced all others. The general features of his system have not changed, but map maneuvers have undergone more rapid development as a military exercise in the last twenty years than in any other period of equal length in their history.

It came to be realized that the old war game maps, which were maps of battle fields—intended to illustrate certain situations—did not give sufficient scope for maneuvers; and that "ideal" maps produced one-sided situations and gave an air of unreality to the exercises. As a result, maps have been made specially for map maneuvers, which have added greatly to their value. These are topographical maps of tracts of real ground made on suitable scales, large enough to give freedom of action to the troops represented, and of sufficiently varied ground to illustrate any situation or operation of war.

Tactical rides, as conducted in the German army, have had an important influence upon the conduct of

the war game. Von Verdy attributes the origin of his method of conducting the war game (Free Kriegsspiel) to his experience in tactical rides. These are exercises in which officers carry on the operations of imaginary bodies of troops over actual ground, writing the orders and messages that would be required if the troops were real. Since dice were not used in these exercises and troops were not represented, it became apparent that dice were not necessary in map maneuvers, which are similar exercises conducted on a map; and that blocks, while useful in illustrating situations, were not indispensable.

Thus while greater importance is attached to the excellence and variety of the maps used, less importance is attached to the other accessories of the game, —blocks, clocks, etc., etc.

In tactical exercises the ponderous three map game has disappeared and now, as a rule, one large-scale map is used by all the participants. In addition each of the participants is usually provided with such small scale maps of the theater of operations as they would be likely to be provided with in war; and, as a rule, are permitted to see the large scale map (which takes the place of the ground) only while situations are being explained and while they are issuing orders. Commanders are not, as a rule, permitted to move the blocks representing their troops, and "moves" (zug) of uniform length have been abandoned. Tables and fixed rules, as part of the mechanism of the exercises, have entirely disappeared. Dice are still used by some of the older officers in Germany but are losing ground. Movements are recorded in pencil notes,—and blocks are only used occasionally and incidentally. The presentation of military situations, the formation of military decisions, and the issue of military orders are the predominant features of the exercises.

The value of these exercises has kept pace with the improvements which have been made in the maps used in them; and they have become in reality what Von Mueffling divined in 1824—a serious means of preparation for war.

THE GAME FEATURE

Thus it appears that, altho map maneuvers owe their origin to a game, the game feature has disappeared from them. Indeed, the game idea has always been the chief obstacle to the success of these exercises as a means of conveying military instruction and training. As a concession to the game feature, the exercises were formerly carried too far. In order to ascertain which of two players will prove the winner it is necessary to push an engagement thru to the bitter end; and in order that no injustice may be done to either, a vast amount of computations must be made and records kept by some uniform system and with extreme accuracy. The use of dice, tables, and inflexible rules serve the purpose of securing fairness to the contending players and of clearing the umpire of suspicion of bias; but when the game idea is set aside these considerations lose their importance.

The game idea manifests itself at field maneuvers as well as in those conducted on the map. At the conclusion of a field maneuver those interested are heard to ask, "Who won, the Blues or the Browns?" and it seems to be a general impression that the principal function of the umpire is to award the palm of victory to one side or the other.

The questions which we should keep uppermost in maneuvers are,—What principles of the art of war are illustrated? Have the troops been handled to the best advantage? What other dispositions might have been made? The question as to which

side has the advantage at the close of the maneuver is relatively unimportant, and may be due to unforeseen circumstances. It is often possible for both parties to execute their missions successfully. The movements of troops prior to the establishment of contact and those made during the early stages of an engagement are often more instructive than the subsequent course of the maneuver.

If it is desired to continue a field exercise after close contact has been established, a decision must usually be made as to the conduct of the troops,—as for instance, that one party or the other must retire, that one or both can not advance until reinforced, etc.; but a determination of losses is useful only as a guide in rendering such a decision. After close contact has been established, however, a field maneuver generally loses resemblance to an operation of war and ceases to be instructive. This is true also of map maneuvers, tho not to the same degree, for the reason, as previously stated, that the director has the exercise under better control and is better able to determine the probable effect of fire. There is, however, a limit—easily reached—beyond which map maneuvers can not usefully be carried.

A few hundred years ago battles were fought by common consent of both armies, and the art of war was limited to the battle field. But at the present day the most important movements of troops generally take place out of sight of the enemy, and these we can feel sure of representing faithfully on a map; but we can not feel so sure of representing correctly the later stages of a combat, for no one can tell with certainty the manner in which future battles will be fought.

THE TITLE

The idea that a map maneuver is a kind of game has always been harmful to this class of military ex-

ercises. As already pointed out it leads to a multiplicity of technical rules which obscure the real purpose. The term "war game" probably has something to do with this misconception and has led many to believe that it is a form of amusement.

The originator of the war game (Von Reisswitz) disliked the name and realized its unsuitability. It had been applied to the "war chess" games which existed before his time, and he retained it only because he could not at that time find one more suitable. The designation "map maneuvers", used in France and Italy, describes more aptly the nature and aim of these exercises.

It has been hoped by some enthusiasts that map maneuvers would prove so attractive and entertaining that they would gain a footing as a popular form of amusement among our officers; but in the forty years which have elapsed since their introduction into our army, it does not appear that any notable progress has been made in that direction. The armies which derive any considerable benefit from them regard them as a military duty.

CHAPTER II

MAPS AND MATERIAL

CLASSIFICATION

The most important accessory of a map maneuver is the map,—upon it the character and success of the maneuver, in a great measure, depend.

The map is to the map maneuver what the ground is to the field maneuver, and, to some extent, the same considerations apply to both. For instance, Meckel says, "The most instructive situations are to be found on maps showing a varied terrain with numerous hills, villages, farms and small woods. A map showing nothing but a level piece of country, or forest only, or merely rough high hills, is unsuitable. A map which embraces a large tract of country naturally offers variety," etc. (Anleitung zum Kriegsspiel, 1904).

The development of map maneuvers in the past twenty years has been marked chiefly by the improvement in the maps used. The maps formerly used were maps of battle fields—prepared for historical purposes. They were only large enough to show certain phases of the battle and were too limited in extent for maneuvers. "Ideal" maps showing imaginary tracts of ground were also formerly used. The new maps are prepared especially for map maneuvers and show large tracts of actual ground; they have entirely supplanted the old maps in all European armies.

The new maneuver maps are free from the

checker board squares with which the old maps were covered, and seem to have lost nothing of value by discarding them.

As the value of the maneuver is dependent upon the excellence of the map, the character of the maneuver is controlled by its scale. The most natural classification of map maneuvers therefore is that based upon the map used. Meckel divides map maneuvers into three classes:

1. The regimental war-game, embracing maneuvers in minor tactics and tactical exercises from the conduct of patrols to the operations of detachments of all arms less in size than a division; for these he considers maps of scales from 1:5000 to 1:6250 (12 to 10 inches to one mile) the most suitable. The name "regimental" is due to the fact that exercises of this character are carried on at the headquarters of each regiment (and detached battalion) in the German army.

2. The great war-game,—devoted chiefly to the operations of divisions. As the division is the smallest independent unit—complete in all arms and administrative staff—its operations may embrace a wide range of military problems. For the great war-game he considers maps of a 1:10,000 scale (about 6 inches to 1 mile) most suitable. These maneuvers are carried on by the older officers in each regiment and by the lesser staffs (corps and division).

3. The strategic war-game embraces the operations of armies, and is conducted on the General Staff maps, scale 1:100,000 (about $\frac{2}{3}$ inch to 1 mile) by the General Staff at Berlin. This exercise is intended chiefly for the instruction and training of general staff officers. Battles are not carried into details, but are considered incidentally—chiefly with a view to their results.

No systematic division of map maneuvers has

been made in our army, but the following seems to be suitable:

1. Maneuvers in Minor Tactics,—embracing tactical exercises from patrolling to the operations of small detachments of all arms,—for use at army posts and the School of the Line,—maps on a scale of twelve inches to a mile, with contours at a vertical interval of five feet.

2. Maneuvers in Grand Tactics,—embracing the tactical employment of large detachments of all arms and of divisions,—for the older officers at the larger posts and for the Staff College,—maps on a scale of six inches to a mile, with contours at a vertical interval of ten feet.

3. Strategic Maneuvers,—embracing the operations of armies,—for the Army War College,—maps of the U. S. Geological Survey, scales of one-half inch and one inch to a mile.

In general, the more minutely we wish to consider the details of military operations the larger should be the scale of the map; but it is believed that the foregoing arrangement would meet our needs without unnecessary multiplication of scales.

In maneuvers in minor tactics it is desirable to represent the fronts of units in line and their depth in column by blocks, pieces of cardboard, etc., cut to correspond to the scale of the map used, in order to indicate accurately the space covered by them. This can not be conveniently done in the case of small units when the scale of the map is less than twelve inches to a mile.

On maps whose scale is twelve inches to a mile the smallest units may be represented—down to the individual soldier; contours may be drawn at a vertical interval of five feet without unduly crowding the map, thus permitting nearly all folds of the ground which are of tactical importance to be shown; and

nearly all natural and artificial features of tactical importance can be shown to scale, thus avoiding much of the distortion of conventional signs.

Maneuver maps should be original, that is, drawn directly from the ground and not merely enlargements of smaller scale maps; for the process of enlargement multiplies errors, adds nothing to the information which the map contains, and leaves the map scant of needful information which the scale permits.

Maneuver maps should not be too small. In using a small map it sometimes happens that when one force has taken up a position, the other cannot appear on the map without creating abnormal situations such as opposing batteries taking first positions within 1000 yards of each other, or a force gaining an abnormally strong defensive position by merely resting a flank on the edge of the map. Small maps offer little choice of measures in forming decisions, and give but little freedom of movement.

The continuous use of the same map is objectionable, as it leads to an abnormal familiarity with distances, features of tactical importance, etc., and makes it difficult to provide that variety in the exercises which is necessary to sustain interest. Besides, any one map is likely to favor unduly a particular arm and to lead to conclusions which may be correct in some instances but which are not of general application.*

AMERICAN MAPS

Maneuver maps of American ground—made especially for map maneuvers—are at present limited to one. This is a map of the vicinity of Fort Leavenworth, Kansas, compiled from surveys made by student officers of the Staff College. It embraces a

*See p. 157, "Duties of the General Staff", Von Schellendorf, 4th edition (1905), British translation.

tract about four miles in width and six miles in length; the scale is 12 inches to 1 mile and the contour interval is 10 feet. It shows a diversified terrain and can be used for a variety of tactical exercises. Copies can be obtained by application to the Secretary of the Staff College. A charge of about one dollar is made to cover the cost of the materials. Printed reproductions of this map reduced to a scale of 4 inches to 1 mile may also be obtained from the Secretary of the Staff College. A 3 inch scale map showing a tract about 18 miles long and 12 miles wide in the vicinity of Fort Leavenworth can also be obtained and is suitable for use as a guide map.

The "Oskaloosa" and "Kansas City" sheets of the Geological Survey map of Kansas, scale 1:125,000, are also available for use in connection with the "Fort Leavenworth" maneuver map; but a larger scale map (about 2½ inches to the mile) of the country within 10 miles of Fort Leavenworth is now being prepared by the U. S. Geological Survey. It is the intention of the Department of Military Art of the Staff College to have this map reproduced on a scale of 12 inches to the mile and made complete in all essential details. When this work is completed it will provide our army with a maneuver map of our own terrain superior to any that we now possess.

A map of the Chickamauga National Park, prepared by the Park Commission in 1896—1901, scale 8 inches to 1 mile, contour interval 10 feet, shows in great detail a tract about 3 miles wide and 4 miles long. It has been used as a maneuver map tho its size restricts its use to problems in minor tactics and the fact that the greater part of the park is covered with forest limits its value. Copies can be obtained from Julius Bien & Co., 140 Sixth Avenue, N. Y. The "Ringgold" sheet of the Geological Survey map

of Georgia, scale 1:125,000, can be used with it as a guide map.

A detailed topographical map of the battlefield of Gettysburg, showing a tract about 5 miles square, was made in 1867 under the supervision of Major General G. K. Warren. The original map is in four sheets, drawn on a scale of 200 feet to one inch (over 26 inches to a mile) and the contour interval is 4 feet. It was reproduced in 1883 on a scale of 1:12,000 (5.3 inches to the mile) but the value of the reproduction as a maneuver map is greatly reduced by its being crowded with representations of troops at different phases of the battle. Copies of the reproduction can be obtained from the Chief of Engineers, U. S. Army. The original map has been recently reproduced by the Military Information Division of the General Staff for the use of the Army School of the Line on a scale of 12 inches to 1 mile, conveniently divided into 25 sections; it shows a diversified tract of typical American ground in great detail and is well adapted to a variety of exercises. No suitable guide map of this region is at present obtainable.

Maps of the battlefields of Gettysburg, Antietam, and Shiloh—prepared by Battlefield Commissions—and the map of the Chickamauga National Park have been reproduced recently by the 2d (Military Information) Division of the General Staff on a scale of 12 inches to 1 mile for use in map maneuvers. The Gettysburg map is somewhat longer (north and south) than the one made by General Warren but it is about a half mile narrower (east and west) and the contours are at an interval of 12 feet. The value of the Shiloh map is reduced by the heavy forest which practically covers the whole tract shown by it. The Antietam map shows an open country covered with cultivated farms (Sharpsburg and vicinity) but its

extent is only 3 by 4½ miles and parts of this area are not shown in detail.

No suitable guide maps for the Antietam or Shiloh maps are obtainable.

Other American maneuver maps are as follows: the map of the maneuver ground at West Point, Ky., made in 1903, scale 2¾ inches to a mile; of the Manassas maneuver ground, made in 1904, scale 3 inches to 1 mile; of the vicinity of Fort Riley, Kansas, prepared in 1903, scale 3 inches to 1 mile; of the vicinity of Fort D. A. Russell, Wyoming, scale 3 inches to 1 mile; of the maneuver ground near Austin, Texas, scale 3 inches to a mile; of the Mt. Gretna, Penn., maneuver ground, scale 4 inches to 1 mile; and the map of the American Lake, Washington, maneuver ground, scale 1½ inches to 1 mile. The Mt. Gretna map is quite small and only a part of the ground is shown in detail. The greater part of the Austin map shows forest destitute of roads.

A variety of interesting maneuvers can, however, be conducted on these maps; tho on account of the smallness of the scale troops can not be represented to scale and minor details can not be worked out.

It would be desirable to prepare at every military post a topographical map of the ground on which field maneuvers are usually conducted by the garrison --drawn on a scale of 12 inches to a mile and with contours at 5 foot intervals. The preparation of the map, if distributed among the officers of the garrison, would serve to prepare them for map maneuvers by giving them the best sort of training for map reading; and the map would be useful in devising and testing tactical problems; in reviewing and discussing field maneuvers, and for use in map maneuvers.

Maps of tracts of ground which is familiar to the participants are advantageous for the use of beginners.

FOREIGN MAPS

There are a great number and variety of foreign maneuver maps. The largest of these is the map prepared by Captain Feistle of the Bavarian army, representing a tract about forty-five miles long and thirty miles wide, of the country in the vicinity of Metz, on a scale of about ten inches to a mile (1:6250). It consists of 266 sheets, grouped in four sections. The sheets are sold unmounted but, for use, are usually mounted separately on card board. The map thus admits of a wide range of military operations and only a few sheets need be actually used at a time. It is published by Hubert Köhler, Munich. The price of the entire map is about $55.00. This map is used at the U. S. Army Staff College.

The general staff maps (scale 1:100,000) and the plane table survey maps (scale 1:25,000) of the country in the vicinity of Metz are almost indispensable adjuncts of the Feistle map; a space which represents on the Feistle map one minute of march represents on the 1:25,000 map four minutes, and the same space on the 1:100,000 map represents sixteen minutes. The sheets of the general staff map used with the Feistle map are the 568 Metz, 569 St. Avold, 584 Solgne and 585 Chateau Salins sheets. The corresponding sheets of the 1:25,000 scale map are designated 3551 Gravelotte, 3552 Metz, 3553 Bolchen, 3562 Ars a. d. Mosel, 3563 Verny, 3564 Remilly, 3575 Lorry and 3576 Solgne. A 1:200,000 scale map of the same region is also useful, especially in devising problems.

Maps of any part of the German Empire on any of the foregoing scales can be obtained from R. Eisenschmidt, 70 Dorotheenstrasse, Berlin.

The "Verny," "Gravelotte," "Metz," and "Ars a. d. Mosel" sections of the plane table survey of the German Empire, scale 1:25,000, have been reproduced recently on a scale of ten inches to a mile, for the

use of our Army War College, and copies of this reproduction can be obtained on application to the 2d (Military Information) Division of the General Staff.

A map of the "Soest" corps maneuver ground, suitable for use in the "great war game," was prepared in 1903 by Captain von Eynatten, German Field Artillery. This map consists of 150 sheets, each mounted separately on cardboard, and each representing 24 square kilometers on a scale of 1:10,000 or about six inches to a mile. It is published by Voss, Berlin, and is sold for about $25.00.

Other modern war game maps in common use in the German army are the "Schweidnitz" map, 64 sheets, scale 1:6250,—the "Chateau Salins" map, 96 sheets, scale 1:8000,—the "Gumbinnen-Darkehmen" map, scale 1:8000,—all made by the Royal Prussian Survey for the use of the army and not generally for sale. The Schweidnitz* map is contoured and hachured, the other two are hachured only.

The modern Bavarian maps called "Landshut" and "Dachau" respectively are said to be excellent.

A map called "North Front of Paris," scale 1:5000, in seventy-seven sheets, price with guide map $24.00, is sold by Voss, Berlin. It is especially adapted to the needs of the "Fortress War Game" but would also be well suited to maneuvers in minor tactics. A map called "Sedan," scale 1:6250, is sold by Voss, Berlin, for about $8.00,—it consists of 25 sheets.

For the strategic war game, German officers use the general staff maps, scale 1:100,000, of the German Empire.

French war game maps are of 1:20,000, 1:50,000 and 1:80,000 scales. The 1:50,000 and the 1:80,000 scale maps are hachured only; they cover the whole of France. The country within 30 miles of Paris has

* The Schweidnitz map is now out of print and further issues of it are not contemplated.

been mapped in 36 sheets on a scale of 1:20,000, with contours at an interval of 5 meters. All French maps can be obtained from R. Chapelot et Cie., 30 Rue et Passage Dauphine, Paris.

War game maps are especially made for the British army by the Ordnance Survey on a scale of six inches to one mile with contours at ten-foot intervals. Maps have recently been specially prepared of portions of each military district, so that each district has its own war game map. These are exchanged to some extent for the sake of varying the exercises but as the British combine the war game with instruction on the ground the most frequent use is made of the maps representing near-by tracts of ground.

The British "Combined Training" (Field Service Regulations) of 1905 prescribes (Par. 184) that war game maps should represent: (a) localities within reach of the station at which the players of the game are quartered, and should be of local interest; (b) localities at a distance from the station, possessing special features; (c) countries of general interest where wars have taken place, or are likely to occur in the future.

The "Surrey Hills" map—belonging to the Aldershot district—is generally considered to be very suitable for map maneuvers; it consists of fifteen sheets, each 24 inches by 18 inches, and is sold (sheets mounted separately on cardboard) for £6. A new war game map, called the "Berkshire" map, has just been completed; it consists of sixteen sheets, each 40 inches by 27 inches, and is sold unmounted for £2 or mounted on cardboard for £8.

For the strategic war game, the Ordnance Survey maps, scale 1 inch to 1 mile, are used.

The London agent for the sale of the Ordnance Survey maps is Edward Stanford, 12 Long Acre, London; from him maps can be obtained of any part

of Great Britain on scales of 6, 1 or ½ inches to 1 mile.

British maps would be more convenient for our use, on account of the language and scales being more familiar, than other foreign maps, but the scale of these maps is not suited to maneuvers in minor tactics. No maneuver maps of a larger scale than six inches to one mile are now in use in the British army, and it does not appear that much attention has ever been given there to maneuvers in minor tactics. The war game blocks used in the British army are merely conventional and do not show troops to scale.

GUIDE MAPS

The maps to which we have heretofore chiefly devoted our attention are the large scale maps which in map maneuvers replace the ground in field maneuvers. In addition, each participant should be provided with such a map of the maneuver ground and the country in the vicinity of it as he would be likely to have in war. These are called guide maps; they should show all roads, towns, important streams etc., in the maneuver ground and, if practicable, within a day's march of it. They are used in framing problems and are more convenient for this purpose than the maneuver map. They are also used by the opposing commanders in preparing their march orders, and may often be used by the umpire in carrying the opposing forces thru the preparatory stage of the exercise.

A discussion of these maps raises the question as to what maps we are to use in case of war on our own territory. Altho no decision of this question is known to have been made, it seems probable that the maps of the U. S. Geological Survey or cheaper reproductions of them—in black ink on light weight paper—will be used, as they are most likely to be

available. A great improvement has recently been made in the work of the United States Geological Survey; the maps now made are all on a scale of about 1 inch to 1 mile (1:62,500) roads are now shown by double lines, and forests are shown in green. However, these maps are not made for military use and are deficient in many details of military importance. For instance, the character of roads, whether metalled or otherwise, is not indicated; and the maps are often so deficient in names of localities as to be of little use in directing the movement of troops. Only a small part of the country, probably less than one-twentieth, has been covered by the 1:62,500 survey.*

The road maps made some years ago for the use of touring cyclists have been greatly extended to meet the needs of automobilists. These maps now cover the New England states, with the exception of Vermont and the northern part of Maine, and cover the whole of New York and New Jersey, the northern part of Delaware, the central part of Maryland, the southern part of Pennsylvania, the northern part of Ohio and Indiana, and the part of Illinois in the vicinity of Chicago. They are on a scale of one inch to three miles and are useful maps for most military purposes. They are being extended by the Automobile Club of America and seem likely to become an important military factor. Copies of these maps can be obtained from the Survey Map Company, Inc., 428 Lafayette Street, New York, N. Y.

The military map of Germany is the General Staff map, scale 1:100,000 (about $\frac{2}{3}$ inch to one mile). It is said that this famous map was begun by Napoleon

*Geological Survey maps have been heretofore made on three scales, 1:62,500, 1:125,000 and 1:250,000 (about 1, $\frac{1}{2}$ and $\frac{1}{4}$ inches to one mile). They can be obtained by application to the Director, United States Geological Survey, Washington, D. C. They cost about 3 cents per sheet.

Bonaparte, who ordered his engineers—immediately after the battle of Jena—to make a map of Germany, and ordered that the scale be 1:100,000.

The scale of the military map of France (Carte de l'Etat Major) is 1:80,000 (about $\frac{8}{4}$ inch to one mile). The scale of the military map of Austria is 1:75,000 (about $\frac{4}{5}$ inch to one mile). That of Japan is 1:200,000.

The British Combined Training (Field Service Regulations) directs that maps one-half inch to one mile (1:126,720) be used in field maneuvers and it is inferred that this map is to be used by British officers in case of war on British territory.

The military maps of Germany, France, Austria and Great Britain are hachured. The elevations of important points are shown by figures.

"In France, the état-major map is a weapon with which officers are constantly exercised and their proficiency in its manifold uses is considered as important as proficiency with pistol or sabre." (Captain T. B. Mott.)

Excellent military maps were made by topoggraphers who accompanied Sherman's army in the campaign in Georgia in 1864; since that time military map making seems to have received little attention in this country.

TABLE

The table on which the map is to be spread should be of soft wood, if pins are to be used. A table top eight feet long and four feet wide is large enough.. The top may be conveniently supported by two trestles two feet four inches high.

BLOCKS

Troops are represented in map maneuvers by a variety of means,—the most common being rectangular blocks of type-metal, lead, porcelain, wood, or

other material, cut to show the space occupied on the map by the units represented.

"To make the exercises attractive and to stimulate the imagination of beginners" (Immanuel) small figures are sometimes used; for instance, the figure of an infantryman standing represents a company in column or line; a figure of a trooper on a horse represents a squadron; a figure of a gun, a battery, etc. Each figure stands on a foot board cut to show the space occupied by the organization represented.

It is objected to lead and type-metal blocks that the paint with which they are coated soon scales or wears off or becomes soiled by handling, and that they then become unsightly and are not easily recognized. Porcelain blocks hold their color better, but they are so light as to be readily disturbed by draughts of air, or jars to the table; wood is also too light.

The method of representing skirmishers by beads strung on wire, devised by Major Eben Swift, General Staff, is very convenient as the wire can be bent to show any desired position of the line. The set of blocks devised by Major Swift can be obtained from the Franklin Hudson Publishing Co., Kansas City, Missouri, at 75 cents per set.

Representations of troops cut from cardboard have recently been improvised at trifling expense by the Department of Military Art, U. S. Army Staff College, and are now used both in the Staff College and in the School of the Line. They meet all the necessary requirements of map maneuvers. Blue paper is used to represent infantry,—red, artillery,—yellow, cavalry,—black, engineers,—green, hospital corps,—orange, signal corps, and buff, wagon trains, etc.; platoons are represented by squares, larger units by rectangular pieces cut to scale, and squads by small circular discs. The pieces are held in place or moved by means of pins with colored heads,—blue for the

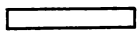
Blue army, and red for the Red army. Cardboard blocks lend themselves readily to changes of organization;* and can be conveniently used on a map in a vertical position—a great advantage in discussions.

The shapes and sizes of the smaller pieces are shown below; the larger pieces are shown by Plate No. 2.

Infantry Company

" Platoon

" Squad

 Cavalry Troop

" Platoon

" Squad

" Machine Gun

3 inch Gun, F. A.

Arrangements have been made by the Secretary of the Staff College to furnish small boxes containing sets of these card board blocks together wih colored pins, strings of beads, and card board scales to officers desiring them at a reasonable price.

It is obvious that similar blocks could be made of metal, bone, wood, or other material if desired. It

* Since the use of these card board blocks was begun, changes have been made in the blocks representing units of artillery, the medical department and the signal corps.

has been objected to the pins that they are injurious to the maps, but in practice it is found that the pins are not moved about a great deal, as but few situations are fully represented; and that if the maps are well mounted they will wear out thru other causes before they are seriously injured by the pins.

The blocks in most common use in the German army are those devised by Col. von Busse; these are sold by G. Bormann Nachfolger, 39 Bruder strasse, Berlin, at about $7.50 per set. A more elaborate and expensive set has been devised by Col. Kunde and is sold by Voss, bookseller, Berlin. The blocks devised by Meckel have recently been revised by Capt. Count von Eynatten and are much used; they are sold by Voss, Berlin, at about $7.00 per set.

A French war game set is sold by R. Chapelot et Cie, 30 Rue et Passage Dauphine, Paris, at about $4.00.

It is obvious that foreign blocks would be of but little use to us as the units represented are different from ours; also that blocks made in this country before the publication of our Field Service Regulations (1905) are now unsuited to our use for a similar reason.

Blocks should correspond to the scale of the map used; if used with maps of other scales they are likely to give wrong impressions.

Officers are recommended to improvise their own blocks; they can thus avoid unnecessary expense and can assure themselves that the pieces are cut accurately to the scale of the map they intend to use, and that they represent modern American units.

SCALES

The scales most frequently used are scales of yards and of miles. A useful scale can be improvised by drawing a scale of yards on a strip of paper and a scale of miles and fractions of a mile on another,

and gluing them on opposite edges of a straight strip of wood of, say eighteen inches in length.

Scales of minutes of march are convenient and save time. Such scales can be drawn on the edge of a piece of cardboard to represent any desired rates of march. It is a convenience to have several divisions of the same length placed consecutively so that any desired number of minutes can be laid off at one time. Two of these scales used simultaneously afford a ready means of ascertaining practically (without computation) the time and place at which troops moving at different rates will meet or overtake one another. This problem arises frequently in determining the time and place at which messages are received.

For determining practically the length of columns, the depth of various units in column (battalion, squadron, battery, etc.) may be drawn on the edge of a card and used as a scale.

Taking distances from the scale of the map with dividers is a slow and inconvenient method—besides, the dividers frequently make holes in the map if not used with great care. Those who are partial to the use of dividers can make a very convenient scale by taking a piece of sheet brass and cutting it so as to leave projecting points at the proper distances apart to represent the distances marched at the different rates in a given time. Such a scale arranged for two minutes of march is of convenient size; a pattern is shown in the cut facing the next page.

By cutting out the two following pages and pasting them on both sides of a piece of cardboard a scale will be obtained that will meet all ordinary requirements.

OTHER ACCESSORIES

Paper and pencils are important accessories. A number of message blanks should also be provided.

The only books of reference needed are the Field Service Regulations, the drill regulations of the different arms, and the service manuals.

CHAPTER III

HOW CONDUCTED

METHODS

Map maneuvers have been conducted in a great variety of ways, and beneficial results have probably been obtained from all.

"For an officer who is to conduct a war game, that method is best in which he has trained himself." (Meckel).

"The war game knows no fixed rules. * * * The development of personal initiative, without which no war game can be of real benefit, must not be restricted by regulations and set schemes. * * * Good results may be obtained by a great variety of methods. * * * The war game stands or falls with the director." (Immanuel).

The manner in which a map maneuver is conducted should depend primarily on the object to be attained. If it is desired to give didactic instruction in tactics, or to explain the nature of map maneuvers to officers who are not familiar with them, the instructor may maneuver two forces on a map himself, illustrating, explaining and commenting on such situations as serve his purpose; this would be an illustrated lecture rather than a map maneuver.

But if the instructor conceals one of the forces wholly or in part, and consults his audience in regard to the movements of the other, or allows the audience to decide its movements, while commenting, criticising and correcting, if necessary; and using the concealed hostile force to demonstrate faults and weak-

nesses which he observes in the dispositions made, the exercise becomes a one side map maneuver. Exercises of this kind may be supplemented by discussions in which several or all officers present may take part under the leadership of the director (instructor); they combine didactic instruction with practice in estimating situations, forming decisions, and giving orders.

But if it is desired to heighten the interest of the exercise by bringing about a contest of opposing wills and unexpected situations similar to those which arise in war, different officers or groups of officers may be designated to command the opposing forces, and each party given only such information of the forces of the other as they would be likely to possess in war, or such as is gained thru the development of the exercise. The maneuver is then two sided; but the director may still retain sufficient control of it to be able to guide it into channels which he thinks will make it more interesting or instructive, or which will illustrate certain principles of tactics which he desires to teach. This control should not be exercised in such a way as to deprive commanders of freedom in making decisions, but by means of plausible orders from imaginary higher authorities, by information of the enemy, by the intervention of supporting troops, by decisions on the results of hostile contact, or by interpretations of the map.

Under the guidance of a skillful director, the two side maneuver, as well as the one side maneuver, may be made primarily an illustrated lecture, the didactic instruction being postponed till the close of the exercise; this is the highest and most beneficial form which the two side maneuver can assume; but it requires serious preliminary preparation on the part of the director, no matter what his experience and professional attainments may be.

If, however, the maneuver is merely intended to give additional experience in the handling of troops, to test the efficiency of certain tactical measures, to test the defensive strength of a certain position, or if the director has but little experience or has had no opportunity for previous preparation; the commanders may be given full freedom of action after the initial situation has been imparted to them, the director acts merely as an umpire and limits his efforts to making his decisions plausible and impartial; the exercise should, however, always be followed by a discussion for the purpose of determining upon the conclusions, if any, which can be drawn from it. Maneuvers of this sort accomplish the best results when all of the participants are well instructed and experienced officers. The methods which should be employed at the beginning are those which make the greatest demands upon the director.

The character of the exercise and the method of conducting it also depend upon the kind of instruction to be given; whether it be in the tactics of a single arm, the tactics of the arms combined, the tactical employment of divisions and larger bodies, special problems in the use of cavalry or artillery, the attack and defense of fortified positions, logistics, or in the duties which will devolve upon the higher staffs in war.

The maps and other facilities available must also be considered, for it may be necessary to adapt the exercise to the facilities available instead of to the object desired. Maps of portions of our own country are to be preferred, but in attempting to use those now available we find ourselves greatly hampered by their small size and the absence of suitable guide maps. Small maps restrict us to the employment of small units, to single phases of military operations, or to maneuvers in which the forces

are restricted to certain localities, as for instance in in the attack and defense of a designated position.

PRELIMINARY INSTRUCTION

The degree of preparation or experience of the officers who are to take part in the maneuver must also be taken into consideration.

Lieutenant General v. Litzmann, Director of the German War College, in a recent (1905) work entitled "Introduction to the War Game" says: "It is essential to success that the director should not assume that he or other participants in the exercise have knowledge or skill which they do not really possess. * * It is only by actual practice with tools that a mechanic learns to turn out good work. Beginners at the war-game must be taught by means of preliminary exercises how to find their way about easily on a war-game map, and how to use the blocks, scales and other apparatus. When they have learned this they are prepared to act as commanders, at first in simple exercises and afterwards in maneuvers presenting greater difficulties. * * The difficulties must be mastered step by step. * * * Dissatisfaction with the war-game is generally a consequence of not having thoroly mastered its technicalities. * * A war-game can not be carried on at all unless the participants understand the use of all arms of the service."

To illustrate his ideas as to the manner in which preliminary instruction should be given, General v. Litzmann takes the hypothetical case of 1st Lieutenant Z, a recent graduate of the War College, who has just returned to his regiment and has been assigned the duty of instructing the ten youngest lieutenants of the regiment in the war-game. The work of Lieutenant Z and his pupils during the three first evenings is described in detail, and the manner in

which the instruction is to be continued is indicated.

At the first meeting Lieutenant Z explains the use of the map and the meaning of the blocks and then assigns the lieutenants to various tasks. Lieutenants A and B are directed to represent with blocks a Blue infantry division advancing on an indicated road with the head of the main body at an indicated point. When this is finished they are asked to show all parts of the advance guard in the positions which they would occupy five minutes later. Lieutenants C and D are assigned a Red officer's patrol and directed to select a good point of observation from which the road on which this Blue division is advancing can be watched. This is a problem in map reading, and its solution brings out an explanation of a method of determining from the map the visibility of one point from another. Lieutenants E and F are directed to show with blocks a detached Red infantry brigade with attached troops of other arms, in a defensive position at an indicated locality towards which the Blue division is marching. Lieutenants G and H are directed to prepare a plan for attacking this Red position with the Blue division. Lieutenants J and K are directed to show with blocks the outpost of a detached Blue infantry brigade having attached troops of other arms—the brigade being in bivouac at an indicated locality.

At the end of a half-hour Lieutenant Z discusses these problems and their solutions, pointing out errors and suggesting better dispositions. He then carries out on the map a small cavalry engagement, commanding both parties and acting as director himself—the other officers taking part only as spectators. He concludes the first evening's work by informing them that at their next meeting they are to carry out the attack planned by Lieutenants G and H on the position selected by Lieutenants E and F, and requests

them to study certain portions of the artillery drill regulations.

He begins the second evening's work with a short discussion of the subject of orders and then assigns the lieutenants to subordinate commands in the Blue division—taking chief command of the Blues and entire control of the Reds himself. The attack is carried as far as time admits, great attention being paid to the movements and positions of troops, the lieutenants interposing orders when it seems to them proper to do so. The exercise is closed with a discussion which relates chiefly to the technicalities of conducting maneuvers on a map, and the lieutenants are requested to study certain additional portions of the artillery drill regulations.

The exercise for the third evening consists in a deployment for attack by the advance guard of a Blue detached brigade of infantry having troops of other arms attached. The advance guard consists of a battalion of infantry and a battalion of artillery. Lieutenant Z commands the Blue brigade and takes entire control of the Red forces as before. The lieutenants command the battalions, companies and batteries, and one acts as assistant to Lieutenant Z. A measure of independence of action is given to them and the exercise is carried to a more advanced stage than the preceding one.

It will be seen that Lieutenant Z begins his course of instruction with map problems on the war game map and follows these with an illustrated lecture and one side maneuvers. After the third evening the lieutenants under instruction are thought ready to take part as commanders in actual war games of a simple character involving the use of only small bodies of troops.

In answer to a possible objection that in these exercises officers were given larger commands than

their experience warranted, General v. Litzmann replies: "The difficulty of leading troops does not lie in the numerical strength of the body employed but rather in the conditions under which it is used—these were purposely made simple."

Captain Oberlindober recommends preliminary exercises before taking up map maneuvers, for the purpose of giving practice in forming decisions quickly; these exercises consist in calling officers to the map separately, giving them military situations and asking their decisions; they are virtually map problems with oral solutions.

ONE SIDE MANEUVERS

The simplest maneuvers are those in which no enemy is supposed to be in contact with the troops employed, and those in which the enemy is imaginary or merely outlined. Such exercises are valuable as a means of instruction in tactics, and map maneuvers are well adapted to them. Map maneuvers in which but one side is represented may be made very interesting as well as instructive; they have never received the attention which they merit.

"To many persons, a map maneuver (to call it by its French name) means necessarily the organization of two parties to operate against each other with perfect freedom, the director acting as an umpire. This method undoubtedly has great advantages; it gives opportunities for practice to a large number of officers; the participants take an interest in the contest with a real enemy, who is equally in the dark as to the dispositions of his adversary. This reciprocal ignorance may bring about the most unexpected situations, similiar to those which arise in actual war.

But there is another side to the question. The umpire cannot act until both parties have made their

pletely that a commander will be able to draw inferences as to the information probably possessed by the enemy; the problem can usually be made shorter by conveying information of this kind to both parties alike by means of a general situation. As a matter of convenience, the date, any statements regarding the weather thought necessary, and any suppositions made concerning the terrain (the depth of streams, condition of roads, etc.) are usually also placed in the general situation; for this information is supposed to be possessed by both parties, and, by placing it in the general situation, it need be drafted but once. When it is thought necessary to state which force is operating in its own and which in hostile territory, this information is usually placed in the general situation.

A special situation is prepared for each commander; it usually contains a list of the troops he is to command, and should inform him of their location and the exact hour at which the operations involved in the solution of the problem are to begin. When a definite mission is to be assigned him it is ordinarily placed in the special situation. The special situation also usually contains information of the enemy; but this, as a rule, is restricted to the results of his own observation or of recent reconnaissance, and ordinarily consists of details which the enemy is not likely to be aware that he possesses.*

* The problems used in map maneuvers and tactical rides are often shorter and more meager in details than those used in field maneuvers, map problems or terrain exercises, for the reason that the director has the exercise completely under his control, and can unfold the situation more fully during the progress of the exercise. Thus, the sound of distant cannonnading may be heard, orders may be received from higher authorities, additional troops may appear on the scene, supporting troops may advance or suffer a reverse, or other circumstances may be conjured up at the will of the director and the situation may be materially modified at any time. Devices of this kind are seldom employed in field maneuvers and, as a rule, the situations presented in map problems and terrain exercises should be complete at the outset. In map maneuvers, however, information in regard to the weather, condition of the roads, etc. should either be contained in the problem, or else supplied by the director orally; while in field maneuvers the actual conditions of weather and terrain are ordinarily taken as part of the situation.

Problems should be short. Situations covering a page or more of written matter have a discouraging effect. Problems are sometimes seen with very lengthy general situations, which show an effort to write a resume of the imaginary war which has led to the situation described; and, after reading two or three pages, we discover, perhaps, that the situation is a simple one which might have been described in a dozen lines; it then becomes apparent that the commanders might have been spared the apocryphal historical matter. It is true that in war, officers are often confronted with orders and information contained in numerous and sometimes conflicting messages and reports, and that training in sifting masses of such matter is useful; but practice of this kind can be given more appropriately by means of map problems than by maneuver problems.

The forces employed should be small. The size of the forces employed should be proportioned to the degree of instruction and experience of the officers who are to command them, and, as a rule, they should be relatively small. "The smaller the forces employed, the more details can be noticed, the more thoro the discussion can be made. * * * When large forces are employed, details of great importance to the majority of officers are necessarily excluded from consideration." (Meckel). The chief objection urged against the employment of small forces is that exercises of this sort are thought unreal. The conflicts of entirely isolated small bodies seldom lead to important results. In war, the commanders in chief will usually keep all parts of their armies in position for mutual support and are more likely to use all of them for the attainment of a common object (for instance, the defeat of the chief army of the enemy) than to permit them to engage in isolated and independent combats. Captain Oberlindober recommends

that the attention to details, which Meckel insists on, be secured by limiting the attention to a part only of the troops considered; and suggests problems involving the employment of covering detachments (advance guards, rear guards, flank guards, outposts, etc.) the main bodies not being actually represented; or problems involving troops in only a portion of the field in a general engagement, for instance the troops employed in an enveloping movement or the contact of divisions near the center of opposing lines.

It is not necessary that the forces assigned to the opposing commanders be equal in strength or similar in composition. When equal forces are brought into contact with each other under approximately equal conditions, the exercise is often brought to a standstill and a long drawn out combat follows; it is not easy to decide the result, and the justice of the decisions is not always apparent. In exercises in "retreat and pursuit", a disparity is necessary to the progress of the exercise. Maneuvers in which the opposing forces are composed of different arms or in which the various arms appear in different proportions are especially interesting and instructive in contrasting the powers, limitations and peculiar functions of each.

If a sufficient familiarity with the tactical employment of companies and battalions has already been gained thru field exercises with troops (which are, of course, more valuable than map maneuvers) problems involving larger forces and introducing other arms should be taken up early; for only a limited view of the field of tactics can be gained from the use of very small forces or of only one arm of the service.

Sometimes one of the contending forces is supposed to be composed of foreign troops, presumably for the purpose of giving instruction in the organi-

zation and tactics of the armies of nations with whom we may at some time be at war; some useful results may, no doubt, be gained in this way, but it should be remembered that facility in handling our own troops is the object of the first importance to us.

The situations presented should be plausible. Officers are not readily interested in situations which appear unnatural or strained; and commanders can not form decisions unless the situation is one which they can comprehend. If the situation appears to be such as might be expected to actually occur in war, the participants will more readily become interested in it and will act with greater promptness.

It is best to begin with problems of a simple character,—i. e., in which the missions of the opposing forces are definite and tangible. For example, one party may be instructed to march from Kickapoo to Leavenworth and the other be instructed to march at the same time from Leavenworth to Kickapoo; or one party may be instructed to hold a position and the other to attack it, etc. Many problems can be framed bringing about rencounters in which the opposing columns approach each other at various different angles; and the deployments in different directions incidental to these exercises form a very valuable training for all officers. When a considerable degree of experience has been gained, it will be better to employ problems which leave the commanders free, to some extent, to act on their own initiative. For instance, an officer may be assigned command of a detachment in the theater of operations and informed of the approximate situations and objectives of the main bodies of the opposing armies but given instructions of only the most general character, or instructions which are not recent and which evidently contemplate a different situation from that which appears to exist. By exercises of this sort military in-

sight is sharpened and the offensive spirit is fostered.

The opposing forces are sometimes started at a considerable distance from each other and merely given missions which will bring them in contact. Events then develop according to the movements decided upon by the commanders, and the form which the exercise will assume cannot be foreseen. While exercises of this kind are occasionally desirable, as for instance, when instruction in reconnaissance is desired, there can be no certainty as to the other tactical measures which will be illustrated, and the amount and kind of instruction which may be given is left to chance. It is apparent that no complete or systematic instruction can be given by adhering exclusively to this method.

Problems should be varied and progressive. The object of the maneuvers, as a means of instruction, should be kept in view; and the problems should be drafted so that the resulting exercises will illustrate different lessons in military art, and should progress from the simplest exercises to those presenting greater difficulties.

Sometimes the forces are placed in contact at the outset and each commander is given such information in regard to his adversary as he would be likely, in actual operations, to possess. The latter method is especially adapted to the ordinary purposes of map maneuvers on account of the limitations of the time which can be allotted to a single exercise. By placing the troops at once in situations which we desire to illustrate, or which will give point to a lesson which we desire to teach, we can be sure of covering the desired ground in the time available; otherwise there is danger of the time being consumed by preliminary movements which are not especially instructive, or which do not illustrate the desired situations.

A fresh problem should be prepared for each

meeting. It sometimes happens that the time allotted slips away before the exercise has developed far enough to illustrate clearly the lesson which the director has in mind, and there is a temptation to postpone the completion of the exercise to another meeting. If this is done, there can be no full discussion of the course of events up to that time without disclosing to each party the situation of the other. If the discussion is postponed its value is impaired, for it is of the greatest value when the events discussed are fresh in the minds of every one. Besides, officers are not likely to take as much interest in the completion of an old problem as they would take in a new one.

Problems based on military history are especially valuable as they give a zest to historical reading; the narration of the historical incident on which the problem is based adds to the interest of the discussion, and the results which were actually attained often throw light upon tactical questions raised by the maneuver.

For use as an aid in devising problems, the large scale maneuver map ordinarily will not be so convenient as the guide map, or other small scale map showing the tract covered by the maneuver map and the adjacent territory.

HOW INITIATED

The "situations" may, of course, be given to the commanders either at the beginning of the exercise or at any convenient time before; but it is customary to follow one of the three methods described below.

1. The problem is transmitted in writing (sealed) to the commanders a day or two before the exercise begins. This method is suitable when the participants have had but little experience or when the problem presents unusual dfficulties. In this case the commanders are usually required to submit their first

orders in writing—and sometimes also a written estimate of the situation—to the director before the time set for the exercise.

2. The problem is transmitted in writing to the commanders a half hour before the exercise. This method gives them time to familiarize themselves with the situation, to reflect upon the courses of action open to them, and to form their decisions; it approximates the conditions of war, for in actual service commanders are always familiar with the greater part of the elements of the military situation, and the most rapid decisions are based on conditions which present but few new features. In this case the commanders are expected to be ready to announce their decisions and give their orders when they are first called to the map.

3. The problem is given at the beginning of the exercise. One of the parties—say the Blue—is called to the map; if the situations are in writing the commander reads them aloud to his assistants, otherwise the director communicates the situation orally. The members of the Blue party refer to the map to familiarize themselves with the localities named and retire. The situation is then communicated in a similar manner to the Red party and, when they have retired, the Blues are again called to the map, the Blue commander assigns his assistants to subordinate commands, communicates his intentions and orders to the director, and the maneuver begins.

The last method, no doubt, offers less opportunity for reflection than would ordinarily be the case in war. But one of the greatest benefits to be obtained from map maneuvers is practice in estimating situations rapidly and in forming decisions promptly, and it is believed that—for officers who are familiar with this work—this method will generally be found to be the best.

There is another method of starting a map maneuver which is frequently used in the German army and which possesses many advantages. A day or more before the exercise, the problem for the Red commander is sent to each of the officers assigned to the Red party, and the problem of the Blue commander is similarly sent to all the Blues. Certain definite requirements are appended to the problem—for instance the commander's estimate of the situation and initial orders may be asked for. The problems are solved as map problems and the solutions are submitted to the director at a designated time before the exercise. The director examines all of the solutions and selects two, one for each side, which he thinks would lead to interesting and instructive situations, and designates the authors of these solutions as the commanders. By this method the director can give the maneuver the form which he desires without detracting from the initiative of the commanders and gains in advance an insight into the intentions of both; he may be able to carry the maneuver thru some preliminary steps at once and thus gain time. All of the participants are, in this way, made familiar with the problem, the interest in it is more general, and fewer explanations are required. The objections are that, since map problems are not generally relished, this feature may bring the whole exercise into disfavor; and that this method does not require the first decisions of the commanders to be made as rapidly as might be necessary in actual war.

A commander can give the director a clear idea of his dispositions by means of a sketch. Sketches are useful even when (as is usually the case) they show no topography and are not drawn to scale, but merely show distances and intervals by means of figures. If the commander has tracing paper or thin typewriter paper, he can place it on the maneuver map or on his

guide map and draw an accurate representation of the position of his troops, trenches, etc. Drawings of this kind greatly facilitate the work of the director, and draw attention to details which might otherwise be overlooked.

ACCESSORIES

The room used by the director should communicate with another, which should be well lighted and provided with chairs, tables, and writing materials where officers who are not engaged at the map can smoke, talk, read, or write at their convenience. The selection of a room opening only into a hall—perhaps cold and ill lighted—where officers have to await their turns at the map, will only cause map maneuvers to be regarded as a hardship and bring them into disfavor.

The task of seeing that the proper maneuver map is laid out, and that small scale maps, scales, blocks, etc., are provided, will in most cases devolve upon the director; he should also see that two or three pads of message blanks and sufficient paper for notes, sketches, and orders are at hand. The Field Service Regulations, and the drill regulations of the different arms should be conveniently accessible.

DIRECTOR'S ASSISTANT

It is believed that exercises in minor tactics will in most cases proceed more smoothly and rapidly, and that better results will be attained if only one maneuver map is used, and the director keeps his own notes, dispensing with an assistant. If, however, an assistant can be found who will follow the exercise attentively, jot down quietly the necessary notes without being told to do so, measure distances marched, compute road spaces—time necessary for deployments, etc., and who will be always ready with needed information, he will contribute greatly

to the success of the maneuver and lighten the work of the director.

But if it is necessary to tell the assistant what he should take down; or if when asked for certain data—as, for instance, "When did the Blue cavalry reach Kickapoo?"—he is unable to answer without a prolonged search thru his notes and the making of new computations, it becomes apparent that the director could do better without him. A communicative assistant who becomes so interested in the exercise that he cannot refrain from seeking to exchange views with the director and the commanders is not desirable.

In complicated maneuvers involving large bodies of troops two assistants are sometimes used, one keeping notes of the Blue force and the other of the Red. But nothing is gained by the division of labor unless the assistants work smoothly and quietly and without unnecessary conversation.

Notes in regard to features of the exercise which the director wishes to bring up in the discussion had best in any case be taken down by himself.

Duty as director's assistant should be acceptable to young officers as it affords the best means of preparation for the duty of director.

DECISIONS

The director is the arbiter in all cases of doubt and his decisions admit of no appeal. The questions which he must decide are many and various. The imperfections of maps, even when they are of large scale, render the representation of the smallest details of military operations dependent, in a large measure, upon the imagination; in order to be able to carry out successfully such exercises as patrolling, the director must have a ready imagination and the power of describing vividly scenes which suggest themselves to him. His imagination must always be

on the alert to interpret the map and supply its deficiencies. Thus a director may be heard to say, pointing to a blue line on the map: "The banks of this stream are steep and six feet high; the stream itself is swollen by recent rains; it is fordable but the current is swift and the bottom soft; you are delayed fifteen minutes, etc." The height and density of forests, the height of hedges, grass and standing crops, the condition of the ground as affected by the weather, etc., etc., must often be decidedby the director in the same way. When the problem involves the employment of larger bodies of troops, the smaller details fall into the background and the strain on the imagination diminishes. In handling forces so large that the element of personal leadership of the commander is lost, and orders and messages are written, the work done in the map maneuver does not differ greatly from that done at the headquarters of a commander in the field.

The most frequent decisions are in regard to the rates at which troops march. The rate of march of infantry or mixed troops is ordinarily taken at eighty yards per minute under favorable circumstances, when computed for considerable distances,—this rate makes allowance for the usual halts. When considering the rate for short distances, as in deployments, this rate is taken at eighty-eight yards per minute. The time, in minutes, required for the deployment of a column of infantry or mixed troops is determined by dividing the length of the column in yards by eighty-eight. Infantry may increase the rate of march for short distances by "stepping out" (for instance when going into action) to 110 yards per minute. Double time is little used.

The rates of march of cavalry and field artillery are;—walk 110 yards, trot 220 yards, and gallop 330 yards. The rate of movement of staff officers and

well mounted messengers in carrying "urgent" messages and orders is taken at 440 yards per minute and the rate of charging cavalry at 660 yards. The rate of march of cavalry over considerable distances including halts, the walk and trot alternating, is taken at five miles per hour or 146 yards per minute.* All of the foregoing rates apply only to favorable conditions,—fresh troops, good roads, etc. Heat, steep slopes, mud, cultivated ground, standing crops, thick brush, and other unfavorable conditions reduce the rates of march, and must be taken into consideration by the director.

Slopes less than 3° do not affect the rate of march but for greater slopes proper allowances should be made. Slopes greater than 5° affect the breathing and may reduce the effectiveness of the fire of infantry if brought into action immediately afterward. Very short slopes are not taken into consideration.

Questions of visibility arise frequently,—and the distance, intervening obstacles, weather, state of the atmosphere, and the size, position, and motion of the object must be taken into consideration. It does not follow that a patrol has been seen because it has reached the top of a hill within sight of the enemy, for this would happen only if the patrol were careless.

In deciding questions of visibility it would be well to keep in mind the general rules to be found in Pars. 59 and 62 of the Small Arms Firing Regulations (1906).

The results of hostile contact must be decided according to the circumstances of the case. Decisions on the results of hostile contact will ordinarily be of one or more of the following classes:

1. That troops are not to advance for a stated period.

* The rates given are intended merely as a guide; they should be modified whenever by doing so real conditions can be approached more closely.

2. That they are not to advance at all unless adequately reinforced.

3. That they must retire to a designated position.

4. That they can not be used offensively for a stated period.

Losses are estimated by the director in accordance with his judgment, based on his experience and study of modern wars. In most cases the estimate of losses need not be stated and is taken into consideration only in determining their probable effect on the conduct of the troops sustaining them.

All decisions should be prompt and unequivocal. Mistakes are pardoned more easily than unreasonable slowness. "Slowness has always been the greatest enemy of the game." (Meckel). The poorest director is not the one who makes the most mistakes, but rather one who decides slowly and hesitatingly, or whose decisions are not clear and definite.

The director sometimes states briefly the reasons on which his decisions are based, especially in cases of hostile contact. "The best results are attained when the decisions of the director carry conviction with them." (Meckel). But the limits of the time allotted for the exercise will ordinarily restrict discussions to the one held at the close of the exercise.

When officers having extended experience or special knowledge are present, the director will do well to avail himself of the opportunity to consult them in regard to difficult questions and may request them to deliver opinions at length to the participants. For instance if an artillery officer is present he may be asked to give an opinion as to the effect of artillery fire in a particular case. But in all cases the director is the final arbiter and is not necessarily bound by such opinions.*

* Major Immanuel recommends that important decisions be made by special umpires, other than the director; but later writers do not endorse this method.

The director should avoid restricting the initiative of commanders. When a course of action is imposed on a commander which is not his own choice, he is likely to become careless of the results and lose interest in the exercise. The director generally has in view a special lesson which he wishes to illustrate by means of the maneuver, but this should not lead him to overrule the decisions of commanders in order to lead the exercise into a particular channel. He is sometimes compelled to interfere to prevent the occurrence of grotesque or impossible situations; but these may usually be avoided by the exercise of tact in giving information and in rendering decisions.

PROGRESS OF THE MANEUVER

The steps by which a map maneuver proceeds are ordinarily as follows:

1. A commander is called to the map.
2. The director imparts to him the military situation,—including the time, the location of his troops, what he has seen or heard, the messages received, etc.
3. The commander announces his decision, gives his orders, and retires.
4. The director decides upon the result of the orders and carries on the exercise until the situation changes to such an extent that one or more of the commanders will probably form new decisions. One of these officers is called to the map and the same steps are repeated.

The more closely the dialogues between the director and the commanders are confined to the matters here stated, the more smoothly and rapidly will the exercise progress. If the commander does not clearly understand the situation as presented to him, or if the director does not fully understand the decisions and orders given, the necessary questions should be asked and answered.

In deciding upon the order in which officers should be called to the map the director should keep in mind their supposed positions and the initiative properly belonging to each; for instance, in the case of a division whose advance guard has come in contact with an enemy, there will be company and battalion commanders at the head of the advance guard who must take action before they can receive orders from the advance guard commander; and the advance guard commander must usually take action before he can obtain orders from the division commander. The action of subordinates in such cases may not always be approved of by the superior, but the director should carry out the order of the officer who properly acts first, and the superior is permitted to modify such dispositions later, if he desires to do so, by means of such orders as could actually be issued.

It is generally preferable to avoid asking commanders the questions, "What do you decide to do?" or "What orders do you give?" for these questions might be taken as admonitions that new decisions or orders are expected. Orders should be given without prompting and should be the natural outcome of the situations presented. However, the director will prompt inexperienced commanders when it appears advisable to assist them, and will prompt others, if necessary, rather than permit the exercise to lag and become tedious. After a degree of experience has been acquired, the director may note the time consumed by the commanders in forming decisions and giving orders, and add this time to that required for the execution of the orders given, in determining the total time consumed by the movement. The director can take the time readily by starting a stop watch immediateiy after communicating the situation and stopping it when the order has been given.

If the director does not think the decision or order to be correct under the circumstances, he should avoid betraying his opinion at the time. Faulty dispositions are best shown to be such by their results, and the director should, as a rule, reserve his opinions for the discussion.

If the commander expresses an intention to issue a written order or send a written message, the order or message is not ordinarily written while at the map; their substance is stated verbally and taken down by the director or the assistant, but they should be actually written as soon as practicable and handed to the director. "Such written work, done in the hurry and excitement of the game, is more useful and instructive than preliminary work done at home with plenty of time. We should require it often." (V. Litzmann).

When the opposing forces are started a considerable distance apart, time can be saved by using only the guide map during the preliminary movements, taking up the large scale maneuver map and the blocks when the forces come into contact.

A commander sometimes states his intentions and wishes in great detail,—giving not only his orders but an extended description of the manner in which he wishes them carried out. In the case of small bodies which the commander is supposed to lead personally, this may be permitted to a reasonable extent; but in the case of troops removed from his personal supervision, it must be kept in mind that they are not animated by his individual intelligence. He must communicate to the director the orders he gives them and the director will decide the time at which the order could reach them and the manner in which the order is complied with. The order must be brief, clear, and definite or it will fail to accomplish the object for which it is intended.

It often happens that when a commander returns to the map he finds, to his disappointment, that orders previously given have been imperfectly obeyed and that his intentions have not been fully carried out. At such times there is a temptation to make protests and enter into explanations which are likely to consume a great deal of time. Of course the director will consider that such protests and explanations are made in good faith and do not result from a desire to issue what are sometimes called "ex post facto" orders,—that the intentions stated have been actually communicated to him and are not such as were completely formed only after the commander had left the map. Nevertheless, it is usually a mistake to attempt to change the course of the exercise in consequence of such protests. The commander's proper remedy is to avoid such mishaps by stating his intentions and giving his orders so clearly and decidedly that they cannot be misunderstood. If he finds it difficult to do this, he should remember that it will be still more difficult when commanding troops in the field and that the effort to overcome this difficulty is beneficial to himself.

It sometimes happens that a director, after learning a commander's intentions and receiving his orders, calls him to the map again before these orders have been fully complied with, for the purpose of imparting to him some information which is of only minor importance and not of a nature to be likely to cause him to alter his decision. In such cases the commander can only reiterate the desire that his orders be carried out; and it becomes apparent that it was only a waste of time to recall him.

It is also objectionable to question commanders as to the manner in which their orders are to be carried out. The director should draw upon his own experience and general information and—when neces-

sary—on his imagination for aid in carrying on the exercise. For instance, on receiving a commander's order, he may reply,—"Your troops deployed and moved forward at 9.40 A. M. as you ordered, but on reaching the position where I place this block you received a heavy rifle fire from the railroad cut here in your front and from this hill on your left. The enemy appeared to occupy a continuous line from this point to this, but you did not see any intrenchments. The suddenness and intensity of the fire caused your line to fall back in some confusion, tho with slight loss, to the cover of the woods here. The movement occupied twenty minutes and you have used the next 10 minutes in restoring order in your ranks. It is now 10.10 A. M.," etc., etc.

The director's skill and tact will be called into play in deciding how far the exercise may be carried, after hearing the intentions and orders of the opposing commanders. If he carries it forward only short intervals before recalling the commanders, the maneuver progresses slowly and there is danger of its becoming tedious. If he carries it further he must at times, mentally personate one or more of the commanders and act for them in accordance with the intentions which they have expressed. Of course this is a fruitful source of differences of opinion, as the commander may claim that he would have acted differently if he had been allowed to act for himself. These difficulties are only to be avoided thru care on the part of the director in learning the intentions of the commanders, and a degree of fairness on their part, which will be shown by a willingness to admit that they might have acted as the director has done.

The time at which the situation will have changed sufficiently to make it advisable to communicate the changed conditions to the officers concerned should at first be determined by measure-

ments, computations and study. Practice and experience will give facility and rapidity in this work, and the director will learn to estimate time and space without considerable errors. It is important that the movements of troops be developed in detail and in an orderly way without losing the sequence of events or omitting any troops from consideration, but the exact periods of time consumed are of less importance.

The director's skill and good judgment will also be shown by hurrying over movements which are indecisive or uninstructive, and in dwelling upon those from which valuable lessons may be learned. Interteresting situations should be fully shown with blocks to as many officers as practicable, consistently with the requirements of the maneuver. Sometimes partial discussions of such situations take place, but ordinarily the limitations of time will restrict discussions to the close of the exercise.

If the object of the exercise is to illustrate the work of cavalry, the cavalry operations will be considered in detail; but it will not be desirable to make every exercise a special study of cavalry operations and, in order to reach other phases of the maneuver in the allotted time, it will often be necessary to pass over the work of the cavalry rapidly.

The first stages of contact between the cavalry detachments of the opposing forces are often interesting. It may be that one cavalry commander has his troops dispersed and out of hand and that his antagonist can break thru and secure important results. But if it appears that neither cavalry can make headway against the other or that the cavalry action will have but little influence on the course of the maneuver, the remaining forces may be brought at once to a position in which important decisions are required of their com-

manders. A proper allowance of maneuver time should, of course, be made for operations thus passed over, tho the director may dispose of them in a few minutes; and the commanders should be furnished such information as they would be likely to obtain during the operations omitted.

It is not necessary to follow the course of every patrol sent out, tho those likely to obtain important information should be followed, not only with a view to ascertaining the information which they will obtain, but also to fix the time when this information will be received by the commander.

As many members of each party are called to the map at one time as can be done consistently with the requirements of the situation. This is done in order to enable as many officers as possible to derive instruction from the exercise. However, when important information is given to one member of a party and cannot properly be commmunicated to the others until a later stage of the exercise (when the information could reach them by the means of communication supposed to be employed) this officer writes the information given him on a message blank and gives it to the director, who calculates the time required for it to reach the officer to whom it is addressed and, at the proper time, delivers it to him. A message which is not likely to cause the officer to whom it is addressed to form a new decision may be handed to him at once and there is no need of computing the time of its receipt.

USE OF BLOCKS

The blocks representing troops are, as a rule, handled only by the director. In some cases, however, commanders are instructed to place blocks to show the disposition of their troops,—for instance, in the case of an outpost or in the occupation of a de-

fensive position, where the commander has ample time to post his troops as he wishes.

Directors differ greatly in their modes of using the blocks (or other means of representing troops). They are not indispensable—map maneuvers can be carried on without them. But a proper use of blocks will contribute greatly to the success of an exercise. By their use the director can illustrate a situation quickly and with few words—saving time and trouble and giving the commanders a clearer view of the situation than could be done without them.

The blocks themselves present valuable object lessons and their use on the map will insure correct ideas being formed in regard to the space occupied by the various organizations in different formations.

The method generally used is to place on the map blocks representing all of the troops of the party at the map and only such troops of the other party as are supposed to be seen.

Some directors use blocks only occasionally and incidentally, to indicate the location of troops which they are describing at the time. In both of these methods the director relies on his memory—assisted by pencil notes—to carry the troops. They require considerable skill and practice, but they possess the advantage of permitting the whole of the map to be shown to the commanders, and exercises can be carried on more rapidly.

But until considerable experience has been acquired, most directors will find it preferable to represent on the map all the troops employed and to keep these representations on the map thruout the exercise. It is then necessary to cover up blocks representing troops hostile to the party at the map, excepting such as are supposed to be seen by them. There can be no reasonable objection to covering parts of the map representing ground that could not be seen

from the supposed position of the commander at the map, for the map is to be regarded—not as a map—but as the maneuver ground. When a part of the map is covered, care should be taken to cover the greater part of it, in order to avoid disclosing the location of the troops covered. The realism of the exercise is heightened by covering parts of the map showing ground which would not be visible to the commanders if they were actually on the ground with the troops, and such parts of the map are sometimes covered merely for this purpose.

Representing all troops with blocks will prevent many of the mistakes which beginners sometimes fall into, such as ordering different bodies of troops to march in such a manner that two or more must occupy the same space at the same time, ordering columns to cross each other's lines of march, etc., and certain tactical lessons are inculcated. But these lessons need not be repeated indefinitely, and, in the case of officers who are familiar with the space and time involved in the handling of troops, the exact manner of representing troops on the map decreases in importance. With practice the director can learn to remove blocks from the map without losing track of the troops which they represent, and when all the participants are familiar with map maneuvers, a column may be sufficiently represented by placing a pin to show the location of its leading element, a battery or a battalion may be shown by placing on the map a scrap of paper, a button, a piece of broken match, etc.

PLAYING OPEN

When the time allotted to the exercise has nearly expired and most of the troops on both sides have been drawn into the engagement or committed to definite courses of action, the director usually calls both parties to the map and the exercise is brought

to a conclusion quickly, the commanders giving their orders in the presence of each other and the director developing the situation rapidly in accordance with them.

DURATION

A map maneuver should not, as a rule, last over three hours; its real limit is the endurance of the director. When he becomes fatigued the exercise is likely to drag and become unprofitable.

SPECTATORS

Spectators will show tact and consideration by refraining from addressing questions or remarks to the director during the exercise. Interruptions of this kind delay the exercise greatly and may prevent its being brought to a satisfactory conclusion. Conversation among spectators which is loud enough to be heard by commanders sometimes divulges information which should not be given them, and is otherwise a source of annoyance.

DISCUSSION

All maneuvers should be followed by a discussion. The director should state the strength and mission of each of the opposing forces, if they have not already become known to all, and should make such an explanation of the situation at the beginning of the exercise as may be necessary to make clear the lessons to be learned from it. He then recapitulates briefly the events of the maneuver, and comments on its salient features,—dwelling chiefly on the most instructive situations presented and the most important decisions formed.

He should not leave the commanders with the impression that he regards their dispositions as the best possible when, as a matter of fact, he thinks them faulty; on the other hand he should avoid harsh

criticism. He will ordinarily avoid saying, for instance, "Captain X made a mistake in failing to attack." Such expressions as, "If Captain X had attacked promptly the results would have been more favorable in this case," or, "Under the circumstances I believe that an attack was advisable," etc., do not give offense, and emphasize tactical lessons sufficiently. In most cases the commanders have already seen the unfavorable results of their bad judgment or oversight and there is no need for the director to harp on them.

It often happens that the maneuver cannot be brought to a satisfactory completion in the time allotted. It should nevertheless be closed with a discussion as stated above.

If time permits, the commanders are asked to explain the reasons for their decisions, but the discussion should never be allowed to turn into a lengthy argument over a point which conveys no tactical lesson or which does not interest any considerable number of the participants. The director should retain control over the discussion as he has done over the maneuver, and should keep in mind that practical military instruction is the chief object of both.

If there are experienced officers present as spectators, who have followed the exercise with interest, they may be invited, during the discussion, to make comments; their remarks are often a source of pleasure and profit to all of the participants.

TWO MAPS

It sometimes happens that no guide maps can be obtained and that several copies of the maneuver map are available. In this case each party may be provided with a copy of the large scale map, and movements may be carried on simultaneously on both. Both parties remain continuously at their maps and

may keep on them blocks representing all of their own troops and of bodies of hostile troops whose location is known. The director must frequently pass from one map to the other and great care is necessary to keep the situations shown on both consistent with each other. It is sometimes discovered that troops of both parties have occupied the same ground, making it necessary to repeat certain movements—giving additional or different information. This method works very well during the early stages of a maneuver in which the opposing forces are not in contact at the outset, but it is usually advisable to conclude the exercise entirely on one map.

THREE MAPS

Sometimes a large scale map is given to each party and the director works at a third map. Information may be communicated by a variety of methods. This method was formerly very common, but has been generally abandoned in tactical exercises, chiefly because it does not bring the commanders into sufficiently close contact with the director.

As a general rule the rates of march are decided and the blocks are handled only by the director, but where commanders remain continuously at large scale maps it is difficult for them to refrain from moving blocks themselves and exercises conducted in this manner have a noticeable resemblance to games of chess or checkers. The protracted study of a large scale map permitted by this method does not approximate the conditions of warfare.

The greatest weakness of map maneuvers consists in the fact that they do not sufficiently simulate the difficulties of controlling the movements of large bodies of troops dispersed over wide areas; and when each commander is provided with a large scale map and a set of blocks these difficulties practically dis-

appear. Nevertheless, we should avoid clinging to fixed methods, and when it is desired to make a more detailed study of the movements of troops, or when it is thought advisable to change the method for the sake of variety, the two and three map methods may be found useful. They are well adapted to siege operations and special problems in the employment of artillery.

Map maneuvers have long been known to be especially well adapted to problems in the attack and defense of fortified places. An excellent work on this subject, entitled "Directions for the Fortress War Game," by Major Neumann, appeared in Germany in 1872, and in 1874 a work on the same subject was published in Austria. One of the modern war game maps ("North Front of Paris," sold by Voss, Berlin) is recommended as specially suitable for maneuvers of this kind.

Capt. E. Dubois of the French army recommends giving each commander a plate of glass which is to be laid over a copy of the maneuver map and troops are drawn on the glass. The director lays both plates over his map and sees the entire situation at a glance. This method appears to make each commander the arbiter of the rate of march of his own troops and makes orders unnecessary.

Maneuvers in grand tactics (called by Meckel the 'great war-game' and by Von Litzmann the 'game for experts') are conducted in practically the same way as maneuvers in minor tactics; maps of somewhat smaller scale and representing larger tracts of country are used, larger forces are employed, and as a rule only the older and more experienced officers take part.

STRATEGIC MANEUVERS

Strategic map maneuvers are intended to give practice in such work as, in war, would fall to gen-

eral staff officers. The organization and concentration of armies, the establishment of lines of communications, the service in rear of an army and on the lines of communications, the use of railway and telegraph lines, the service of information,—as well as orders for the movements of troops, cantonments and bivouacs, dispositions for battles, lines of fortifications, the keeping of records and the preparation of reports, etc., are taken up. Most of the work, in these exercises, is done by the participants at their homes. Meetings are held only for the purposes of discussion, giving important information, or announcing important decisions.

No attempt is made to conclude an exercise at one sitting, but a campaign is carried on continuously for several days during such hours as are available. Small scale maps of large areas are used (1:100,000 in Germany, but our Geological Survey maps answer very well) and at least three maps of the entire theater of operations are required,—one of which is used by the director and one by each of the parties. An umpire may be detailed for each party, to make needful decisions in regard to rates of march, etc., and keep the director constantly informed of all movements of the party to which he has been assigned. Blocks may be placed on the director's map representing all troops employed on both sides. Commanders are not permitted to see this map until the final discussion.

Meetings for discussions are occasionally held by each party separately, and these usually result in fresh tasks being assigned to the subordinate commanders. There should be a sufficient number of officers in each party to admit of a chief of staff being assigned to each commander in chief, an officer to command the communications, and at least one officer for each body of detached troops. If possible each

infantry division and cavalry regiment should have a commander. The work done (orders, reports, etc.) is in writing; the written work of each party should be collected by the chief of staff and arrangements should be made to have this work criticised. If the commanders of each party are well instructed officers of high rank, they will criticise the work of members of their own parties. The value of strategic map maneuvers as a means of instruction depends to a great extent on the discussion of the written work.

"The most important and most delicate duty of the director is the communication of information of the enemy. It is the most important because operations depend upon this information, and it is the most delicate because it is very difficult to give just the right measure of information and no more. One of the most interesting features of the strategic game is the uncertainty which prevails as to the enemy's movements,—actual war conditions being simulated in this respect as much as possible.

Therefore much care must be exercised in giving information of the enemy; but the measures taken for reconnaissance by both parties must be given due consideration. The more experience the director has had in high staff positions in war, the more familiar he will be with the peculiarities of messages and other sources of information, and the better will he be able to hit on the right amount and kind of information to be given, and to mix correct, inaccurate, incomplete, and false information together in proper proportions. He should not, however, restrict the freedom of commanders in selecting means for obtaining desired information." (Anleitung zum Kriegsspiel, Meckel.)

Officers with the experience here spoken of are not numerous in our army but the experience of our Staff College shows that well instructed officers—such

as the students of the Staff College—are able to conduct map maneuvers well enough to make them interesting and profitable.

Information may be given in writing, in the form of messages and reports from cavalry commanders, patrols, spies, etc., or it may be given verbally,—the director at one time personating a prisoner, at another a spy who has come to make an oral report, etc.

Combats cannot be followed out in all their details; but their results, duration, and the situations growing out of them, etc., must be decided by the director in accordance with his judgment based on the relative strength and situations of the forces engaged.

"The best time to bring a maneuver to a close is at the end of a day's operations or at the end of a battle, since most of the written tasks are dependent on these periods" (Meckel).

A war diary* should be kept by each party and Meckel recommends that each commander be required to submit a brief report of each day's operations and that the chiefs of staff be required to make reports of the entire campaign.

*See p. 313, "Duties of the General Staff", Von Schellendorf, 4th Edition, 1905, British translation.

CHAPTER IV

PROBLEMS

PRELIMINARY EXERCISES

1. A column of mixed troops is marching south on the Kickapoo-Atkinson-Frenchman road. At 10 A. M. its commander, who is at the head of the column, has reached the bend of the road 300 yards south of Kickapoo Hill; at the same moment a mounted messenger starts from Frenchman with an important message for him; when and where does he receive it?

See page 49. A scale of minutes of march for "infantry or mixed troops" is laid along the road with one division opposite the location of the commander; a scale of minutes for a "mounted messenger" is applied to the road beginning at Frenchman and a small (estimated) deduction is made on account of hills; and it is seen that at the end of ten minutes, or at 10:10 A. M., the commander and the messenger will meet near Section Lane.

2. At 10:32 A. M., the commander mentioned in the preceding problem reaches the Millwood road; at this moment an important message is sent to him by a mounted man from the cross-roads 200 yards west of T. Meyers (southwest of Kickapoo). When and where is it received?

The solution is similar to that of the first problem—only, in this case, the messenger overtakes the commander instead of meeting him.

3. Represent fully on the map a Blue column composed of 2 regiments of infantry,

1 battery, and 1 squadron of cavalry, marching in hostile territory northward on the Kasten-Frenchman-Kickapoo road with the leading infantry element opposite Dolman. Red cavalry is reported to be at Kickapoo. Show in detail the same column 5 minutes later. How much time will this column require for deployment? (See page 70.)

4. A Blue force is taking up a defensive position along the north front of Leavenworth. A cavalry patrol reports seeing at 11 A.M. from Hancock Hill a column of Red troops on the Kasten-Frenchman-Atkinson road; that there was cavalry all the way from Gauss to Frenchman, infantry from Burns to Taylor, and a continuous column of infantry and artillery north of the Millwood road, the tail of which had just cleared Atkinson. The patrol was driven away before further details were noted. What is the strength of the Red column?

Solve by building it up with blocks or by applying to the road the units shown on the edge of the cardboard scale (Plate 2).

5. How long before the Red force mentioned in the preceding problem can occupy Atchison Hill with artillery?

6. A Blue patrol is on Wagner Point watching a column of Red troops as they emerge from cover at Moore (on the Atchison Pike) move west, and disappear behind trees near Flint. The patrol commander wishes to note the time the various units require in passing a certain point. The column is composed of a squadron of cavalry in column of twos which passes the point at a gallop, followed by a battalion of artillery which passes it at a trot, and then by a regiment of infantry at quick time. What information does the director give him and how is it obtained?

The various units as shown on the edge of the card board scale (Plate 2) are applied to scales of minutes of march at the rates stated (Plate 3). The squadron is applied twice, because it is in column of twos, to the scale for "cavalry walk", as we have no scale for "cavalry gallop", remembering that the rate for the gallop is about three times that for the walk; or it may be applied to the scale of yards, (Plate 2) noting that 440 yards or ¼ mile is covered at a gallop in 1⅓ minutes. The periods are, cavalry 3 minutes, artillery 6 minutes, and infantry 8 minutes.

7. A Red company is falling back westward on the Millwood road, after attacking unsuccessfully a Blue outpost at the edge of the wood east of L. Kern. The Blues have a machine gun on the Millwood road at the edge of the wood. The Blue commander directs the machine gun to fire on the retreating Reds as they cross the Salt Creek bridge. If this is not practicable, the machine gun is to fire on them as soon as they are seen. What is the ruling of of the director?

The chief obstruction is Hill 873, north of Sharp, which is about 800 yards from the machine gun. The elevation of the machine gun is 900 feet; the line of sight from it to Hill 873 drops 30 feet in 800 yards; and as the line of sight is a straight line it must continue to fall at the same rate. The bridge is less than 800 yards from Hill 873 and is more than 30 feet lower; consequently it is sheltered from the machine gun. 800 yards west of Hill 873 the elevation of the line of sight will be 840 feet, at a point nearly opposite J. E. Daniels; a little further west the ground rises to an elevation of 840 feet; the line of sight will strike the ground a little east of the 840 contour. The director rules that the Reds

will be visible from the post of the machine gun when they reach J. E. Daniels.

ONE-SIDE MANEUVERS

1. A Blue battalion from Atchison has halted for the night at 2 P. M. near J. Aaron; it is in hostile territory and a Red cavalry patrol has recently been seen near Taylor. Show the Blue camp and outpost.

The director reconnoiters the outpost and camp with Red patrols; thus indicating posts of observation from which they can be overlooked. He also brings small parties of Reds by routes which are not observed to favorable points from which they can fire on the camp; and, later, attacks the Blue outpost with a Red battalion.

2. A troop of Blue cavalry has just crossed the Missouri river with instructions to disable the railroads in the vicinity of Atchison Cross. At 10 A. M. it has reached Merritt Hill and its commander has just received information that about 40 dismounted Red cavalrymen are in the railroad cut 250 yards northeast of Atchison Cross with their horses in the woods to the west of them. What is his decision and what orders does he give?

The director commands the Reds and gives appropriate information in regard to them.

3. A troop of Blue cavalry in friendly territory has reached South West Hill via the Zimmerman road, and has received information that a train of 50 impressed two-horse wagons, containing provisions which have been levied in Leavenworth, is standing on Metropolitan Avenue south of the U. S. Penitentiary and is to start for Kickapoo (where there is a Red outpost) in one hour, escorted by one platoon of Red infantry and a squad of (12) Red cavalry. It is now 1 P. M. June

26,—the atmosphere is hazy. The commanding officer of the Blue troop decides to attack the train. Show the manner in which he disposes his troops and explain the mode of attack contemplated.

4. A Blue detachment, consisting of 2 regiments of infantry, 1 battery, F. A., 1 squadron of cavalry, 1 company of engineers and one field hospital, has just detrained at the Kickapoo Station and is directed to cover the detrainment of other troops there. A Red force of all arms is crossing the Missouri river from the east at Fort Leavenworth, and Red cavalry has appeared on Hancock Hill. Show the disposition of the Blue detachment.

5. A Blue independent infantry brigade, with troops of other arms attached, has crossed the Missouri river and halted for the night at Fort Leavenworth, placing an outpost consisting of 1 regiment of infantry, 1 battery, F. A., and 1 squadron of cavalry on the Sheridan Drive ridge. It is 2 P. M., May 6, and the weather is fair. Red troops of all arms are known to be at Easton. Show the disposition of the outpost. (Salt Creek and Plum Creek are serious obstacles).

6. A Blue advance guard consisting of 1 infantry brigade with 2 batteries, F. A., and 1 squadron of cavalry has reached Frenchman from the north. Its cavalry has occupied Sentinel Hill and reports a Red infantry regiment with 1 battery, F. A., in position on Atchison Hill—the right flank at the railroad cut, the left on the spur north-west of Government Hill, and the battery on Atchison Hill. It is 10 A. M. on a clear summer day. The Blue force (a division) must occupy Leavenworth before 1 P. M. Give the decision and orders of the advance guard commander. (Salt Creek is a dry ravine about 3 feet deep).

MAP MANEUVER NO. 1

Detail:

Director, Captain A.
Commander, Blue, Captain B.
Assistants, Blue, Lieutenants C and D.
Commander, Red, Captain R.
Assistants, Red, Lieutenants X and Y.

All of the participants have been notified that the next exercise would be in cavalry patrolling.

The following problem, in writing, is sent to Capt. B a half hour before the exercise.

GENERAL SITUATION

A Blue detachment in friendly territory occupies Leavenworth. A Red detachment from Atchison has halted northwest of Kickapoo. The date is August 15. Corral Creek, Salt Creek, and Plum Creek are serious obstacles. The atmosphere is hazy.

SPECIAL SITUATION,--BLUE

The Blue outpost consists of one battalion of infantry and one troop of cavalry, and has orders to hold the approximate line of Metropolitan Avenue and observe to the north as far as Kickapoo. At 2 P. M. the outpost is in position, the infantry occupying the line Circus Hill—Prison Hill—Avenue Hill, and the cavalry South West Hill. The cavalry commander has decided to send out two officer's patrols of one officer and eight enlisted men each, to perform the reconnaissance ordered.

The situation is communicated to Captain R at the same time as follows:

GENERAL SITUATION

A Blue detachment in friendly territory occupies Leavenworth. A Red detachment from Atchison has halted northwest of Kickapoo. The date is August 15. Corral Creek, Salt Creek, and Plum Creek are serious obstacles. The atmosphere is hazy.

SPECIAL SITUATION,--RED

The Red outpost consists of one battalion of infantry with a machine gun platoon and two platoons (50) of cavalry. It has orders to hold the approximate line of the hills 858, 929, and 1000 and to reconnoiter thru Fort Leavenworth and Frenchman. At 2 P. M, the outpost is in position and the outpost commander has decided to send out two officer's patrols (cavalry) of one officer and 12 enlisted men each, to perform the reconnaissance ordered.

The director sees that the proper maneuver map is laid out and that the scales, blocks, message blanks, paper and pencils are provided. As the maneuver is a simple one he does not require an assistant. At the hour set for the exercise he calls the Blue party to the map.*

Director: Captain B will give his orders to the patrol commanders now. He can arrange the outpost later.

Captain B then reads the general and special situation to his assistants and says: Lieutenant C will examine the roads between Salt Creek and the Missouri river and then push on to Kickapoo. Lieutenant D will go west of Salt Creek and find the enemy. Messages will be sent to South West Hill.

Director: You may place blocks to show the arrangement of the outpost.† Lieutenant C, what steps do you take?

Lieut. C: I inspect my patrol and then move out at a trot to Atchison Cross and then take the road west of the target range. At the target butts I detach a non-commissioned officer and two men to follow Hancock Avenue, recon-

*It is immaterial which party is called first.

†This is exceptional—the director seldom permits anyone to handle the blocks except himself. It is done here to save time and because the director wishes to devote his time and attention to the patrols.

noiter Fort Leavenworth and the road by the Prison Cemetery, and rejoin me on the Millwood Road. I move north from the R. R. cut along the ridge and follow Sheridan's Drive and the Millwood road.

Director: What is your formation?

Lieut. C: There are two men about 400 yards in front of me, one with me, and two about 400 yards behind me. The McGuire—Sharp trail is watched when it can be seen from Sheridan's Drive,—all of the men are cautioned to avoid exposing themselves to view from the west. I continue to move at a trot.

Director: What are your intentions, Lieut. D?

Lieut D: I will move along the trail to Government Hill, then take the Atchison Pike to Frenchman, and there turn north on the Kickapoo road. At the road fork south of Flint I send two men up Sentinel Hill to observe the country to the north and west, and rejoin me on the road. I ride at the head of my party; there are four men with me, three follow at about 300 yards, and one follows 100 yards further back.

Director: What gait do you take?

Lieut. D: Walk and trot.

Director: Do you send anyone on the Atchison Pike west of Frenchman?*

Lieut. D: At Frenchman I send three men west to the railroad. They will move thru the R. R. cut to the hollow north of T. Flint, then follow the depression parallel with the railroad and about 100 yards northeast of it, keeping one man——

*The director prompts Lieut. D more than is desirable, but he does not wish the exercise to lag.

Director (interrupting): What orders do you give these men?*

Lieut. D: To go west to the railroad, turn north, and rejoin me near A. Daniels. I show the location of A. Daniels to the chief of the party on my pocket map.

Capt. B has now completed the arrangement of the outpost. He has placed Co. A on the north slope of Circus Hill, Cos. B and C on Prison Hill and Co. D on Avenue Hill. He explains that Co. A is to hold the line from the Missouri river to the first ravine west of Grant Hill, inclusive,—that Cos. B and C hold the line from this ravine to the U. S. Penitentiary, inclusive, and that Co. D holds the line from the U. S. Penitentiary west to include 20th St., communicating with the cavalry which is observing the Atchison Pike, Barnes and Zimmerman roads from the Government Hill—South West Hill ridge. Capt. B also explains that he will be with Cos. B and C, which are to perform the functions both of a support and a reserve, that Co. A places a picket on Grant Hill and sends an infantry patrol to examine the Pope Hill—Devin Ridge woods—and that Cos. B and C place a detached post on Long Ridge. These are shown by blocks.† The director now directs the Blue party to withdraw and requests Capt. B to call the Red party to the map.

Before the Red party enters, the director conceals the entire south end of the map as far north as Merritt Lake. The cavalry patrols have not yet been represented.

Capt. R's orders to the Red patrols are:—A detachment of the enemy is at Leavenworth. Our out-

*Lieut. D cannot control every move of these men after they leave him; —besides, he could not see this depression from Frenchman, and he is taking more time than the director is willing to devote to this subject.

†It would be good practice for Capt. B if he were required to write an order placing this outpost in position.

post will hold the line of the hills 858, 959, and 1000. I am ordered to reconnoiter thru Fort Leavenworth and Frenchman. Lieut. X, with a cavalry patrol of 12 men, will go thru Frenchman; Lieut. Y, with 12 cavalrymen, will go thru Fort Leavenworth. Information of the enemy's strength, position, and intentions is important. Messages will reach me at Hill 929.

Lieut. X states his intentions as follows,—I will take the Spencer—A. Daniels—Millwood road. At Taylor S. H. I turn south toward Frenchman. I will march at a trot in normal formation.

Director: What is it?

Lieut. X: A noncommissioned officer and two privates constitute the point and keep 500 yards ahead of me. Two troopers are detailed as right flankers and two as left flankers,—they are to march 300 yards from the road and the same distance behind the point. The point and flankers gain their distances and intervals at a gallop. A rear guard of two men follows me at a distance of 500 yards.

Director: You reach A. Daniels without seeing anything of the enemy,—your attention is then called to the fact that nothing has been seen of your flankers since passing Plum Creek.

Lieut. X: I wait at A. Daniels for them to communicate with me.

Director: They come up to the Millwood road ten minutes later.

Lieut. X: I will then go on.

Lieut. Y gives his intentions as follows,—I will take the Atkinson—Taylor S. H.—Millwood road to Fort Leavenworth, moving at a trot and keeping all of my party on the road. Two troopers are sent ahead but they do not keep any fixed distance,—they

gallop ahead till they come to a place giving a good view to the front and stop there till I signal them to go on. Lateral roads are observed by sending two troopers out on each till they come to a place giving a good view. They go out at a gallop but return at a trot. My rear is usually covered by some of these men catching up but I have no other rear guard.

In the meantime Capt. R has arranged his outpost. One company, posted on the road where it crosses the stream between Hill 858 and L. A. Aaron, holds the line Hill 858—L. A. Aaron, inclusive; one company posted on the north slope of Hill 929 holds the line L. A. Aaron, exclusive,—Hill 929, inclusive; and one company holds the line Hill 929, exclusive,—Missouri River. The reserve, consisting of one company, the machine gun platoon, and one platoon of cavalry, is in the southwest angle of the wood 250 yards west of Hill 929. There are no posts in front of the outpost line. The outpost is shown with blocks and the director conceals the part of the map north of the Millwood Road.

The Red party now retires. It is apparent that the patrols of Lieuts. D and X will come in contact with each other, and the director studies their movements (particularly noting whether or not the two Blues sent to Sentinel Hill would have seen the Red patrols) and then calls Lieut. D.

Director: At 2.35 P. M. you have reached Burns without having seen or heard anything of the enemy. The two men sent to Sentinel Hill have rejoined you but have nothing to report. As you come upon the Burns ridge you see two Red cavalrymen near Taylor on the road coming toward you at a trot.

Lieut. D: I rein back partly behind the ridge and signal to my party to close up.

Director: The Reds continue to advance and you now see another—three in all.

Lieut. D: I dismount my party by signals to fight on foot and take a position, under what cover I can find, on the Burns ridge. The horses are placed in the ravine south of the ridge, under cover east of the road.

Director: Your men are concealed by weeds. When you are in position the three Reds have passed Dolman. They do not appear to have seen you.

Lieut. D: I order the sights laid down and open fire at will.

Director: The Reds retire at a gallop. You see two or three more mounted Reds on the road near Taylor.

Lieut. D: I hold my ground and watch them.

Director: Please call Lieut. X (*To Lieut. X*) You reach Taylor at 2:37 P. M. without having learned anything of the enemy. On reaching this point you hear firing to the south and as you come over the ridge you see your point retreating at a gallop. They report that they were fired on from the low ridge (here) which they point out to you. They saw no one.

Lieut. X: I examine the ridge attentively with my glasses. I also examine the road to the south and look especially for dust rising in the vicinity of Frenchman.

Director: You see nothing of the enemy and no dust.

Lieut. X: I signal to my flankers to come in.

Director: Nothing has been seen of your left flankers since you left the Millwood road. Your right flankers were seen near Moss some minutes ago but they are not now in sight.

Lieut. X: I draw sabers and charge the position from which we were fired on.

Director: (*To Lieut. D*) You are charged by about seven mounted Reds proceeding along the road from Taylor.

Lieut. D: I open rapid fire on them when they are opposite Dolman.

Director: I consider the fire sufficient to check the charge. There would be difficulty in pushing the charge home in any case on account of the ravine northeast of Burns, which is crossed only by a wagon bridge. The Reds fall back in disorder behind the Taylor ridge.* Lieutenant D will retire.

Lieut. X: I assemble all of my party as soon as I can and move west, by Moss, north and west to the two hills marked 900, and follow the railroad track southeast. I keep three men on my left, watching the Blue position. I send a brief report to Captain R. I will take the Atchison Pike to Government Hill and then turn south along the ridge.

Director: Write the report and bring it to me when you are next called in. Please ask Lieutenant D to return. (*Lieut. X goes out and Lieut. D comes in*). When the Reds were repulsed the three men detached by you at Frenchman rejoin you. They tell you that they have been watching two Red cavalry men who were about 300 yards west of Taylor but have now disappeared in the direction of Taylor.

Lieut. D: I order them to go back to the ridge northwest of Burns and watch the Reds from there. I hold my ground and write a message.

Director: Bring the message to me the next time you are called in. At 2.55 P. M. you are in-

*It will be noticed that the director does not assess losses—tho they are no doubt severe. Losses are not always assessed when the exercise can be carried on without doing so. If the director thought the losses sufficiently heavy in this case to warrant it, he might inform Lieut. X that the subsequent forward movement was impracticable.

formed that a party of mounted Reds is moving west near the Moss house.

Lieut. D: I mount my party and gallop forward to the Taylor ridge, sending three men in the direction of Moss to keep touch with them.

Director: At 3 P. M. you are on the Taylor ridge and have information that there are about eight Reds near the A. T. & S. F. R. R., west of you—moving southward.

Lieut. D: I send another man to join the three already detached and carry them an order to follow the Reds and watch them. I go to Kickapoo at a trot by the Taylor S. H.—A. Daniels road, with three men.

Director: You may retire.

The director now studies the movements of the patrols of Lieuts. Y and C. Altho Lieut. C announced an intention to move at a trot, the director believes that he would not trot continuously from South West Hill to Atchison Cross, and estimates that some minutes would be lost in giving instructions to the detached patrol and in gaining the ridge between the target butts and Wagner point.

Lieut. Y will probably walk up the steep slope south of Plum Creek and down the slope near J. E. Daniels. In studying the question as to when these patrols would see each other, if at all, he takes into consideration the haze in the atmosphere, Lieut. C's precautions to avoid exposure, that Lieut. C does not stop to use his glasses, and the hedge and other obstacles along the south side of the Millwood road. On consulting his watch the director concludes that Capts. B and R and Lieuts. D and X will not be likely to take any further active part in the maneuver and he consequently now admits them as spectators. Lieut. C is also called.

Director: (*to Lieut. C*) As you approach Hancock Hill the men in front of you signal "enemy in sight" and one of them comes back at a gallop and informs you that he has just seen two Red cavalrymen on the Millwood road,—that they were going east at a trot and disappeared in the wood here (east of Kern). They did not appear to have seen your men.

Lieut. C: I halt and post my men so as to watch Sheridan's Drive in both directions and the Millwood road. I then write a message to Capt. B.

Director: What is the substance of the message?

Lieut. C: That two Red cavalrymen have been seen near Kern. I will then move cautiously along the edge of the wood to the Millwood road. I halt there and wait for the patrol which I sent to Fort Leavenworth.

Director How long will you wait?

Lieut. C Not more than fifteen minutes. If the patrol does not come up before that, I will then go on to Taylor S. H. and from there north to Kickapoo.

Director: You may retire. Please ask Lieut. Y to come in. (*To Lieut. Y*) On approaching the Prison Cemetery at 2:37——

Lieut. Y It was my intention to send three men east to the Missouri Pacific railroad to follow the railroad south and join me at the crossing of Shady Creek. I intended to detach them immediately on entering the wood east of Kern.

Director You gave me your intentions as far as Fort Leavenworth and said nothing about this patrol. I make it a rule not to go backward even if it causes some dissatisfaction for I have

neither the time nor the inclination to make computations of time and space twice.

Lieut. Y: I must send this patrol because my road goes diagonally thru the wood and I can see but little until I reach Shady Creek. The patrol is to push directly across the wood and watch the open ground to the east. It was my intention from the first to do this.

Director: Very well, I will credit you with having sent the patrol.* At 2.38 P. M. you are approaching the Prison Cemetery and have reached the point where I place this block when you hear firing in front of you and the two men in your front come back at a gallop. The fire continues. Your men have seen nothing.

Lieut. Y: I order them to go back and find out something. That is what they were put there for.

Director: One of the men has been hit and the other's horse goes lame. Your party is under fire.

Lieut. Y: I will change the sound man to the sound horse, and send him and two other men to the front to reconnoiter.

Director: While you are giving the orders for this another man and two more horses are disabled.†

Lieut. Y: I countermand the orders, take cover at the side of the road, and dismount to fight on foot.

Director: The fire ceases.

Lieut. Y: I form skirmish line dismounted and advance at a double time.

Director: You see thru the wood a Blue trooper re-

* This concession of the director is more apparent than real.

† The director assesses losses to convince Lieut. Y that he is really under fire, of which fact he seems oblivious.

tiring southeast at a gallop. When seen he was where I place this pin, but he disappears immediately.

Lieut. Y: I mount and move forward at a trot sending three men forward at a gallop.

Director: As you approach Shady Creek (here) you hear firing and the three men sent forward come back at a gallop. They have seen two dismounted Blues here (in the ravine west of Blunt Hill) and believe that there are seven or eight Blues there.

Lieut. Y: I dismount in the Shady Creek ravine and send my horses to cover about 100 yards to the west. I will open fire on the Blues if they show themselves. I wait here for my detached patrol.

Director: How long will you wait?

Lieut. Y: As it has not joined me already I suppose it has met opposition. Nevertheless, I will wait ten minutes. I will then charge the enemy dismounted.

Director: Your patrol does not arrive. When you advance you find no one in the ravine, but three Blue troopers are seen here, galloping south. They turn west (here) and disappear in the vicinity of the cavalry stables.

Lieut. Y: I mount and pursue them.

Director: It will now be necesary to close the exercise, for we have only enough time for the discussion. Please call Lieut. C.*

The director now takes the covers from the map,†

* The only reason for excluding Lieut. C is a willingness to delude Lieut. Y into the belief that the party opposing him is commanded by Lieut. C. It is, of course, commanded by the director. The operations of Lieut. Y's patrol exemplify the one-side maneuver. (It would have been well to ask Capt. B to take command of this patrol as he is not employed at the time.) This exercise might profitably have been carried further.

†The director might have required Capts. B and R to make sketches, tracings or written notes showing in detail the arrangement of the outposts —or he might have made such notes himself. It would then have been unnecessary either to use blocks or to cover up any part of the map.

states the strength of both outposts and explains their dispositions, and states the strength and missions of the four officer's patrols. He then comments on the exercise as follows:—

The cavalry of the Red outpost (with the exception of the patrols) was held in the reserve. If this cavalry had been pushed to the front to hold the main roads, say at the bridges over Plum Creek, it might have held hostile patrols at a distance. Both of the Blue patrols would probably have come in contact with the Red infantry outpost line and would probably have developed its position.

The formations taken by the four officer's patrols were different and the exercise illustrates some of the advantages and disadvantages of the methods used. Lieut. D, being at the head of his patrol, gained an early view of his antagonist, and placed his patrol in concealment more quickly than he otherwise could have done, but the post selected is dangerous. By placing himself at the head of his men an officer can control them by means of signals—quickly and silently. Lieut. X, in selecting what he calls a "normal" formation, found that his flankers could not make rapid progress over difficult streams, fences, plowed ground, etc., and was considerably delayed by them. These flankers did not see much that could not be seen from the road and this work was very exhausting for their horses. He also found, when he desired to use the effective strength of the party in combat, that it was too much dispersed.

Lieut. C did not appear to take into consideration the advisability of reconnaissance on his flanks, and seemed more desirous of avoiding observation than of gaining information. His route—along Sheridan's Drive—gave an excellent view of the country to the

north and west, of which he did not fully avail himself.

Lieut. Y adopted an ironclad rule of sending patrols on every lateral road. This is not necessary in every case. In this case, the Millwood road and the Taylor S. H.—Frenchman road were covered by Lieut. X's patrol and the Sharp—Klasinski trail could be overlooked from the road.

The patrolling of lateral roads is exhausting work and should be done sparingly. In addition to the reconnaissance of lateral roads, it is often advisable to send patrols to good posts of observation near the road taken by the main party. Lieut. D's sending two men to the top of Sentinel Hill is approved.

Cavalry patrols, as a rule, move rapidly over ground from which a good view cannot be obtained, and pause at good posts for observation. Lieut. Y might have stopped for a minute on the ridge west of J. E. Daniels to sweep Salt Creek valley and the heights to the east with his glasses.

The non-arrival of Lieut. Y's detached patrol at the crossing of Shady Creek was due to the fact that this patrol, not being familiar with the country, lost the trail in the wood and wandered about for some time without being able to find the way out. Lieut. C was similarly disappointed in the non-arrival of the patrol which he sent to Fort Leavenworth. This patrol was commanded by a young corporal possessed of more zeal and military ardor than discretion. He discovered Lieut. Y's patrol near the Prison Cemetery, and immediately instituted an independent campaign on his own initiative. He succeeded in delaying Lieut. Y's patrol and inflicting some losses on it, but he would have shown better judgment if he had evaded Lieut. Y and rejoined Lieut. C as he was ordered. These

incidents illustrate the mishaps which occur not infrequently in the case of patrols commanded by inexperienced leaders and show that the performances of detachments sent beyond our own observation do not always come up to our expectations.

The message sent by Lieut. C from Hancock Hill did not contain information possessing any special significance. It was known that a detachment of the enemy was near Kickapoo and it was to be expected that small parties of cavalry would be seen in the vicinity. The information was not of sufficient importance, in this case, to warrant sending a message; but it would have been otherwise if no enemy had been known to be about.

Lieutenant C's decision not to pursue the Reds seen, but to continue his reconnaissance, is approved. We might, of course, speculate on the probable consequences of an onslaught by Lieutenant C on the rear of Lieutenant Y's patrol while it was engaged in front; but, as a rule, the pursuit of hostile patrols is more likely to result in broken down horses and wasted time than in the accomplishment of anything advantageous.

I cannot approve of Lieutenant X's mounted charge under the circumstances. He, of course, did not wish to be delayed, and he perhaps believed the Blue force to be insignificant; but the facts that his movements were confined to a narrow road and that there was a ravine in front of the enemy should have been given more weight in making his decision. His perseverance in continuing his reconnaissance and not allowing himself to be drawn into a dismounted combat with his antagonist is commended.

I cannot see any sufficient reason for Lieutenant D's detaching half of his patrol to follow Lieutenant X. His mission was to learn what he could of

the main hostile force, and these four men might have been very useful to him later.

Lieutenant D would also, in my opinion, have shown better judgment by leaving the main road after passing Frenchman, selecting a route further west from which he could keep the road under observation, and seeking high ground at the enemy's flank or rear from which his position could have been overlooked. Crook Point would probably have served this purpose and could have been reached without opposition, tho its importance would have warranted the Red outpost in placing a detached post there.

The roads in front of an army are usually held by its cavalry. Cavalry patrols are most likely to secure information when directed toward the flank or rear of an enemy. When a patrol is to traverse long distances, it must use roads in order to cover them in good time. But in this case the distances were not great enough to make it important to remain on the roads.

Our exercise today illustrates some of the difficulties and dangers of cavalry patrolling and shows that skill, judgment, boldness, and willingness to sustain losses are essential requisites in a leader of a cavalry patrol.

MAP MANEUVER No. 2

Detail: Director, Capt. A
Commander, Blue, Capt. B
Assistants, " Capt. C and Lieuts. D, E and F
Commander, Red, Capt. R
Assistants, " Lieuts. X and Y

As the exercise is a simple one, no assistant for the director is detailed.

All of the participants were notified at the last

meeting that the next exercise would be in the duties of advance and rear guards.

At the hour set for the exercise the director calls the Red party to the map and hands to the commander the following general and special situations, which the commander reads aloud to his assistants.

GENERAL SITUATION

On November 2, a body of Red infantry is retreating south thru Fort Leavenworth, Kansas, pursued by a larger force of Blues. The weather is clear and the roads are dry. Corral Creek is unfordable.

SPECIAL SITUATION,—RED

The rear guard of the Red infantry consists of one company, under your command. At 10 A. M. you are with the rear party (1 section) which has reached One Mile Creek on Grant Avenue, and have received a message from your commanding officer, directing you to hold the enemy in the vicinity of One Mile Creek for an hour in order that the bridges over Corral Creek may be prepared for demolition. Your support (3 sections) is on Grant Avenue opposite Devin Ridge. A small party of Blue cavalry has been following you closely and is now near the corner of Grant and Pope avenues. Dust can be seen rising in the north end of Fort Leavenworth.

After finding on the map the various localities mentioned in the problem, the Red party withdraws and the Blue party enters. The Blue commander is handed the following problem which he reads aloud.

GENERAL SITUATION

On November 2, a body of Red infantry is retreating south thru Fort Leavenworth, Kansas, pursued by a larger force of Blues. The weather is clear and the roads are dry. Corral Creek is unfordable.

SPECIAL SITUATION,—BLUE

You are in command of the advance guard which consists of two companies of infantry and a squad (12) of cavalry. Your orders are to push the enemy vigorously. At 10 A. M. your cavalry is at the corner of Pope and Grant Avenues in touch with the enemy; your support (one platoon) is at the corner of Grant and Kearney Avenues, and the reserve (1½ cos.) is west of the U. S. Military Prison. The main body of the Blue force is approaching Shady Creek, where it is to halt ten minutes. You are mounted and with the support.

The Blue party examines the map long enough to find the places named and then withdraws. The Red party is called to the map and Capt. R announces that he will send the 4th section (now the rear party) under the command of Lieut. Y to the ice house south of Merritt Lake—to hold Merritt Hill from Grant avenue, exclusive, to Prison Lane, inclusive, and patrol to Engineer Hill; and send the 3d section under command of Lieut. X to knoll 850 at the east end of Devin Ridge—to hold Devin Ridge from Grant Avenue, inclusive, to the Missouri river, and patrol toward the bridge over the Missouri river. The 1st and 2d sections are to halt at the east side of Grant Avenue opposite its junction with the Cavalry Drill Ground road. Capt. R is with them.* Capt. R says that this order is communicated to Lieut. Y verbally immediately on receipt of the message from the commanding officer; that immediately afterwards he goes to Devin Ridge and gives the order to Lieut. X who would naturally halt on seeing the movement of the rear party.†

*As an exercise Capt. R might be required to write this order, or he might be required to make a sketch or tracing showing his dispositions.

†According to the data it appears that the message was received before 10 A. M. The director considers that Capt. R's order to Lieut. Y was given at 10 A. M.

Lieut. Y says that he will order selected sharpshooters to fire on any Blue cavalry seen watching his movements, move his section by the trail south of Merritt Lake to the ice house, deploy two squads about 100 yards south of the ice house, place one squad in the depresion about 50 yards further south, and send one squad to Engineer Hill.

Lieut. X says that he will deploy the whole of the 3d section on knoll 850, with the exception of one squad which is ordered to go to the old railroad bed and follow it as far as the buildings, which can be seen to the northeast of Devin Ridge, and watch the roads in that vicinity.

Capt. R says further that the 1st and 2d sections are placed in concealment and the men lie down; he wishes to know how many mounted orderlies are with him and the director replies that there are none.

The director places blocks, to represent the dispositions described, shows them to the Red officers, makes pencil notes of their positions (which he also impresses on his memory) and then removes the blocks from the map. The Red party retires.

The Blue party enters, and Capt. B says that he will continue to advance on Grant Avenue. He assigns Capt. C and Lieut. F to the reserve, Lieut. E to the support, and Lieut. D to the cavalry. The director requests all of the Blue party except Lieut. D to withdraw.

Director: At about 10 A. M. two or three of your advance troopers are fired on from the east end of Merritt Lake. You move forward to a good post of observation about 300 yards southwest of the car station and see about twenty or thirty Red infantrymen moving west along the south side of Merritt Lake. You also see indistinctly thru the trees a formed body of Red infantry moving east from

Grant Avenue on Devin Ridge. You have been following a company of Red infantry, but now all Red troops have disappeared from Grant Avenue. What is your estimate of the situation?

Lieut. D: It appears that the Reds are deploying and probably intend to check us on One Mile Creek. I will watch them, send a patrol to each of their flanks, and send a written message to the advance guard commander.

Director: What orders do you give the patrols?

Lieut. D: Four men are sent by Pope Avenue to Engineer Hill. Four are sent east to take the road which joins Farragut Avenue just north of One Mile Creek. They are to find the enemy's flanks, remain in observation, and send messages here.

Director: Write the message you send to Capt. B.

While Lieut. D is writing the message, the director studies the map and decides upon the time required for the movements ordered. He then calls Capt. B, hands him Lieut. D's message, and informs him that this message is handed to him by a trooper at the corner of Pope and Grant Avenues at 10.06 A. M. The message is as follows:

From Advance Cavalry At 300 yds. S.W. of Car Stat'n. Communicated by Mtd. Messenger.
Date 2 Nov. Hour 10.05 A.M. No. 13.
To Capt. B,
Fired on near Merritt Lake. Red infantry is deploying on south side of 1 Mile Creek. Have sent patrols to reconnoiter their flanks. Remain in observation.
Received 10.06 A.M. D, Lieut.

Capt. B decides to halt the advance guard, reconnoiter the ground in his front, and wait for reports from the patrols.

Director: At the best near-by post of observation you find Lieut. D. With the aid of your glasses you make out three or four Reds at a locality pointed out by Lieut. D—(here), south of the ice house. At 10.08 A.M. you observe a Red infantry patrol ascending the southeast slope of Engineer Hill—a minute or two later you observe a struggle between this patrol and four mounted Blues—the Reds are victorious and the Blues retire westward. At 10.11 A. M. you hear firing to the southeast—at 10.13 two mounted messengers approach—the first is from the patrol which you have seen driven from Engineer Hill and he informs you that his patrol retired to the U. S. National Cemetery—the other tells you that his patrol was fired on from an embankment of an abandoned railroad on the north bank of One Mile Creek and near Farragut Avenue, and that his patrol retired northward to a cut of the abandoned railroad.

Capt. B: I wish to question the last messenger.

Director: Proceed.

Capt. B: Is the road from here to the cut you speak of sheltered from view from Devin Ridge?

Director: The further half of this road is exposed—the messenger drew fire from the east end of Devin Ridge when he returned.

Capt. B: What is the nature of One Mile Creek?

Director: He did not reach it. He noticed that the woods were thick east of the railroad bridge, but he could not see the creek. None of your troops have reconnoitered it, but from where you stand you can see that west of the railroad bridge the south bank is steep and three or four feet high. What is your estimate of the situation?

Capt. B: The enemy occupies a very long line, half a mile or more; his patrolling north of One Mile Creek looks aggressive. He has probably been reinforced. Nevertheless my orders require me to maintain a vigorous offensive and I will attack at once. If I encounter superior numbers I will soon be supported by our main body. Where is the infantry of the advance guard at present?

Director: It halted at 10.07 A. M., in compliance with orders from you. The support is at the car station—the men under cover west of Grant Avenue. The reserve is at the corner of Grant and Kearney Avenues.

Capt. B: I will assemble the officers at the car station and issue an order for the attack. My order is as follows:

"The enemy is in position on Devin Ridge and south of Merritt Lake. His strength is not known.

We will attack, enveloping his right flank.

The support (1st Plat. Co. A), commanded by Lieut. E will advance at once east of Grant Avenue to the ridge between here and One Mile Creek and support the main attack, which—consisting of Company B under command of Captain C—will move by Farragut Avenue against the east end of Devin Ridge.

The 2d Plat. Co. A, under command of Lieut. F, will form the reserve and move under cover to the railroad siding.

The cavalry will observe the enemy west of Grant Avenue.

Send messages to the reserve."

I will also send a message to the commanding officer, informing him that the Reds are in position on Devin Ridge and appear to have received rein-

forcements. The director notes the substance of the order,* estimates that it was issued at 10:25 A. M., and inquires of the subordinate commanders their intentions.

Capt. C says that he will march east on Kearney Avenue to Farragut and then march south on Farragut Avenue to One Mile Creek, and that he will order the men to march on the sides of the road to avoid raising dust.

Director: When you reach this point (east of old R. R. cut, 500 yards south of the bridge over the Missouri River) the head of your column is fired on from this point (old R. R. embankment).

Capt. C: I deploy my leading platoon and advance it at double time—march direction, knoll 850 at the east end of Devin Ridge. The other platoon follows in column of squads at 100 yards.

Director. You are impeded by thick underbrush, One Mile Creek, which here has almost vertical banks about six feet high, and a railroad cut.

Capt. C: I urge my men forward as rapidly as possible.

Lieut. E indicates his route, shows the position he will take, and says that he will open fire on any Reds seen, but will fire slowly until Co. B assaults and then order fire at will on Devin Ridge.

Lieut. F indicates the route he will take.

Lieut. D says that he will order his eastern patrol to rejoin him as soon as Co. B is seen coming up and that he will open fire on the Red patrol on Engineer Hill from his present position and order his patrol at the Cemetery to do likewise.

The Blue party withdraws, and the director computes the time necessary for the movements ordered, makes notes, and recalls the Red party.

*As an exercise Capt. B may be required to write this order subsequently.

Director: Your company is in the position ordered at 10.06 A. M.—the dust which was seen in the northern part of Fort Leavenworth becomes denser for a time but disappears at about 10.08—at 10.06 you see Blue infantry near the car station, but it disappears in a minute or two apparently toward the west—at 10.10 you hear firing both at Engineer Hill and near Farragut Avenue, and shortly afterwards receive messages informing you that your patrols have repulsed small parties of Blue cavalry—at 10.27 you hear light firing in the direction of the Infantry Barracks and shortly afterward from the National Cemetery—at the same time you see about 50 Blue infantrymen cross to the east side of Grant Avenue near the car station—at 10.31 a desultory fire is opened on Devin Ridge from the ridge about 170 yards northeast of Merritt Lake—at 10.35 you see a cloud of dust, considerably larger than the former one, in the north end of Fort Leavenworth—at 10:42 you——*

Capt. R: At 10.40 I send an order to Lieut. Y directing him to withdraw his section to the post of the reserve.

Lieut. Y: On receiving the order I will signal the patrol on Engineer Hill and will withdraw without showing myself, moving at first south and then east.

Director: At 10.42 you see three or four Blue infantrymen near the railroad siding—the dust in Fort Leavenworth has disappeared—at 10.47 you hear rapid firing near Farragut Avenue

*The director unfolds the situation slowly and impressively, making occasional pauses. Commanders give orders on their own initiative whenever the situation appears to them to demand action on their part. The director sometimes asks a commander for his estimate of the situation in order to be sure that the information given is understood. It is not to be expected, however, that the commander's estimate of the situation will be identical with that of the director.

which increases in volume, together with loud shouting and the sound of whistles,—at the same time a sheet of fire breaks out from the ridge in front of you—you see Lieut. Y with his section (here) where I place this block, approaching from the west.

Capt. R: I retire to Pope Hill with the reserve, keeping under cover of the trees east of the road—I send an order to Lieut. X directing him to fall back to Rabbit Point and informing him that I will support him with fire from Pope Hill—I order Lieut. Y to retire slowly along the street car track leaving a patrol on the ridge temporarily to observe the enemy—I send a message to my commanding officer informing him that I am attacked by superior numbers and am falling back to Pope Hill and requesting him to support my withdrawal from Pope Hill with fire from the south bank of Corral Creek.

The director now calls the Blue party and takes up the discussion.* He states the special situation given each party, recapitulates rapidly the steps taken by each, shows with blocks the situation of both parties at 10.50 A.M., and comments as follows.

The line which the Red company undertook to defend was entirely too long. The assignment of a section of a defensive line to a fraction of a company is very unusual. A company should not be broken up in this way. The sections were so long that they could not be effectively defended by the troops assigned to them.

The men sent to the ice house were of very little use there. The Blues could not advance across Merritt Lake, and if they advanced west of it they would have been seen in time to allow the Red company to

* The exercise might have been carried farther.

flank them from Merritt Hill or intercept them on Long Ridge. The long line occupied had the effect of deceiving the Blue commander and, owing chiefly to the dilatory character of his movements, it was succesfully held; but, if he had attacked promptly between Grant Avenue and the railroad, the Reds would have needed all of their men there to check him.

Sending patrols so far to the front and flanks was not essential to carrying out the mission of the Red company. These patrols gave the Blue cavalry a great deal of annoyance and prevented it from pressing in on the flanks of the Red company. They also added to the mystification of the Blue commander. Their success in this case was due largely to their finding exceptionally good positions; one was protected on its right by the river and the other found on Engineer Hill an exceptionally good field of fire in all directions. But the detachment of small parties of infantry to such distances is hazardous.

Several minutes were consumed by Lieut. D in writing a message which in this case might better have been sent verbally.

The decision of the Blue commander "to attack at once" is approved; but he was slow in arriving at this decision and did not carry it out promptly.

The situation of the Red rear guard with an unfordable stream at its back offered an opportunity to the pursuers to cut it off or inflict heavy losses on it; but such opportunities can be turned to account only by boldness and activity on the part of the pursuers.

A frontal attack over open ground is certainly a delicate affair against even an inferior enemy. But here the ground was not open. The bed of One Mile Creek especially favored a direct attack. The Blue advance guard might have advanced with little exposure to the ridge east of Grant Avenue and from

there could have gained the bed of One Mile Creek at a run—advancing one platoon at a time, supported by the fire of the other three. Devin Ridge could have been carried with the bayonet before the Blue commander finished issuing his orders for the attack.

Such wide turning movements as that ordered are seldom employed by such small forces and, in this case, this method of attack was inconsistent with the mission of the advance guard. The advance cavalry was in touch with the enemy and the infantry was close behind. The deployment of the Reds was observed. The sooner the attack was launched against them the less opportunity they would have to select a position and strengthen it. The Blue main body reached the corner of Grant and Kearney Avenues at 10.35 A. M. and would have been ready to support the attack if needed.

As it happened, the Blue main body was compelled to wait a considerable period for the advance guard to act, and this delay is not likely to be acceptable to the commanding officer. When he finds that the carefully planned attack of the advance guard strikes nothing but an empty ridge his dissatisfaction will be increased. Captain B's experience should warn us against jumping at the conclusion that our enemy has been reinforced, and especially against reporting it as a fact, without definite information.

Captain B's selection of a point of attack was unfortunate; the difficulties encountered by the main attack in reaching Devin Ridge were unusual and hardly to be expected; but the possibility of meeting such obstacles should be kept in view in ordering an attack over ground which has not been reconnoitered.

The ground in front of the center of the enemy's position lay in plain sight and contained no serious obstacles. The enemy's left was covered by Merritt

Lake. Captain B seems to have reasoned that since the attack could not envelop the enemy's left, it must inevitably be directed against his right.*

DIRECTOR'S NOTES

MAP MANEUVER NO. 2

BLUE		RED	
Cavalry patrol (4) Eng. Hill	10.10	In position	10.06
Cav. patrol (4) old R. R.	.11	3d sec. Lt. X, Devin R	
Support, Capt. B, corner Pope Ave.	.06	4th sec. Lt. Y, sou. Ice House. 1st and 2d secs. Capt R, east of Grant.	
Reserve, Capt. C and Lt. F, Kearney Ave.	.06	Patrol 4th sec. (8) Engr. Hill	.10
Cavalry patrols report	.13	Patrol 3d sec. old R. R. embankment	.11
Offs. assemble car stat'n	.20		
Order attack	.25		
Message to C. O. (enemy position reinforcem't)	.27		
Cav. fires on Eng. Hill	.27		
1st Plat. Co. A, ridge	.30		
2d Plat. Co. A. R. R. siding	.42		
Co. B starts Pope and Kearney Ave.	.30	Message Capt. R to Lt. Y, (sent)	.40
Co. B arr. old R. R. cut	.47	Message Capt. R, recd.	.44
Main body cor. Kearney Ave.	.35	Lt. Y, car track	.50
		Capt. R rets. to Pope H.	.48
		Capt. R mess. to Lt. X	.48

NOTE. There can be no invariable form of keeping notes. They vary with the exercise and the needs of the director. They do not contain a complete record of the exercise, but only such data as the director may need to assist his memory. If the director has an officer to assist him, the notes will be kept by the assistant. Written orders, messages and memoranda written by commanders and sketches or tracings made by them showing dispositions, orders of march, etc., are attached to the notes and lighten the work of the director.

MAP MANEUVER NO. 3

GENERAL SITUATION

On Sept. 15, a Blue corps whose base is Kansas City is near Atchison, pursuing northward a beaten Red corps. The Mis-

* The decisions, orders, etc., in this and the preceding exercise are not intended to be taken as models of correctness. It will be noticed that the director states his opinions in a fearless and positive manner. This is thought desirable; but, of course, the particular opinions advanced here are not authoritative.

souri Pacific R. R. is the line of communications of the Blue corps. The country is friendly to the Reds. The weather is clear and cool and the ground is dry. Salt Creek and Plum Creek are serious obstacles.

SPECIAL SITUATION,—RED

A regiment of Red cavalry is approaching Leavenworth from the southwest with the object of destroying the Missouri Pacific R. R. and capturing a small Blue detachment reported to be there. Two troops have been detached to proceed by the Atchison Pike to cut off any Blue troops found retreating northward to Kickapoo, which is reported to be strongly held by the Blues. You are in command of these two troops and at 8 A.M. are with the main body of your detachment on the Atchison Pike 500 yards west of Mottin. A squad of 12 men is opposite Mottin and has just reported seeing a thick cloud of dust in the direction of Sentinel Hill.

SPECIAL SITUATION,—BLUE

A battalion of Blue infantry, without horses or machine guns, under your command, has been at Leavenworth guarding the railroad. You have received reliable information that a large force of Red cavalry with artillery has been seen about ten miles southwest of Leavenworth at 6 A. M., apparently marching on that place; you decide to retire to Kickapoo which is well garrisoned and protected by field works. At 8 A. M. your leading element has reached Frenchman, the main body (3½ companies) has reached the fork of the road leading to Gauss, and you have just received informa-

tion from a flanking patrol that a small party of horsemen was moving east on the Atchison Pike near Mottin.

The opposing forces are here placed in contact at the outset and an important decision is required of each commander. The Red commander reasons that the dust seen may be caused by Blue troops retreating from Leavenworth to Kickapoo on the Kasten-Frenchman road, and that it is his duty to capture them if he can. If they are too strong to be captured by his detachment, he must inflict losses on them and check or delay them until reinforcements can be obtained. Since Salt Creek is a serious obstacle, his best opportunity for checking the Blues is at the bridge near Frenchman. The possession of this bridge is important, but if he cannot seize it, he can bring dismounted fire on it while the Blues are crossing or attempting to debouch from it. His *decision* is to move forward rapidly on the Atchison Pike, take such action as circumstances require as the situation develops, sending a message to the regimental commander as soon as it it is definitely known that Blue troops are in his front. His *orders* are "Gallop, March".

The Blue commander does not believe that the main body of the Red force, from which he is retreating, is on the Atchison Pike, because it was reported to be southwest of Leavenworth, while the Atchison Pike runs northwest. The horsemen seen are thought to be Red scouts reconnoitering at a distance from their main column. However, they may be the leading element of a strong patrol or of a detachment large enough to be able to cause considerable annoyance. As it is now 8 A. M. and the Red force was reported to be composed of mounted troops and to be only ten miles distant two hours before, they may now be

entering Leavenworth; he has, consequently, no time to lose and must not allow himself to be checked or delayed. If the information on which he is retreating is correct, the Red force is probably an independent brigade of cavalry. He will be safe when he crosses Plum Creek. His best road is the direct Frenchman—Kickapoo road, but he has a defile directly in front of him (the bridge over Salt Creek). Here a comparatively small force of the enemy might delay him by compelling him to force a crossing under fire, and inflict losses on him while crossing and attempting to debouch on the other side. He *decides* to expedite the march of the battalion until it is across Salt Creek to a rate of march approximating the "cavalry walk" (110 yards per minute); his *order* is "Step out" (delivered verbally to the battalion). In case fire is opened on the column, the advance guard will without orders at once attack the enemy; it will be reinforced if necessary; a new advance guard will be pushed forward; and the former advance guard, depending on the position and conduct of the enemy, may become successively a flank guard and a rear guard. After Salt Creek is crossed the high ground west of the Frenchman—Kickapoo road is the natural feature of the highest importance; from it the fire of an agressive enemy, even if inferior in strength, could prevent the battalion from advancing in column on the road; it will, consequently, be necessary to cover this ridge with a flank guard, which will march northward along the ridge if practicable; if it is engaged so closely that it cannot gain ground to the flank, fresh detachments must be thrown out, while those first sent fall back to the road and form a rear guard.

This maneuver illustrates the passage of a defile, debouching from a defile, a flank march and the delaying and harrassing action of cavalry. The ques-

tion as to whether cavalry can delay an infantry column more effectively by operating against its head or its flank will, no doubt, receive attention in the discussion.

MAP MANEUVER No. 4

GENERAL SITUATION

On June 20, a Blue army, whose base is Kansas City, Missouri, is operating in hostile territory in the vicinity of St. Joseph, Missouri, against a Red army whose base is Omaha, Nebraska. The weather is warm and clear. Salt Creek and Plum Creek are insignificant as obstacles.

SPECIAL SITUATION,—BLUE

The 1st Infantry is at Beverly (three miles east of Fort Leavenworth) guarding the communications of the Blue army and has detached the 1st Battalion, with a machine gun platoon and four mounted orderlies, to go to Kickapoo and seize a quantity of supplies reported to have been collected there for the Reds. The battalion leaves one platoon at the Fort Leavenworth bridge over the Missouri River and at 8 A. M. is marching on the Millwood Road and its leading element has reached the Kickapoo—Frenchman road, when its commander, who is with the advance guard, is informed by a spy that about 1000 cavalry camped at Lowemont the preceding night. At the same time mounted men are seen in the vicinity of Breidenbauch and a cloud of dust is seen further west.

SPECIAL SITUATION,—RED

The 1st Cavalry has been sent south to reconnoiter the west bank of the Missouri River and cover the removal of supplies which have been collected at Kickapoo. The regiment camps at Lowemont on the night of June 19-20, and at 8 A. M. is on the Millwood road; its leading element, which is

opposite Breidenbauch, reports seeing a column of Blue infantry east of the Taylor School House.

The commanders may be directed to submit sketches showing in detail the arrangement of their columns at 8 A. M. Altho it is stated in the problem that Salt Creek and Plum Creek are insignificant as obstacles, the season of the year (June 20) should be taken into consideration in regard to movements of troops off the roads. Cultivated ground would be soft and heavy and growing crops would impede progress but would afford cover for dismounted men. The Blue battalion commander finds himself confronted with conditions which were not contemplated by the regimental commander in sending the battalion to Kickapoo. The mission of the Blue 1st Infantry is to guard the communications of the Blue army (apparently the Burlington R. R.); the sending of the battalion to Kickapoo appears to be in pursuit of an object of secondary importance, and it seems that no considerable resistance was expected or a stronger force would have been sent. The Red force reported appears to be a regiment of cavalry but its mission is not known; it is probable that it will attempt to cross the Missouri River and destroy or interrupt the Burlington railroad; the Blue battalion has left one platoon at the Fort Leavenworth bridge, but this is probably insufficient in view of the changed conditions. The battalion could probably reach Kickapoo and seize or destroy the supplies there; but the importance of this task does not justify exposing the battalion to destruction or capture.

The battalion commander *decides*: to send the adjutant with two mounted orderlies to the vicinity of Sprong to reconnoiter the enemy; to retire to the edge of the wood east of Kern immediately, the advance guard becoming a rear guard; to send a mes-

sage to the regimental commander, informing him of the changed conditions. If mounted Red troops appear in superior numbers and especially if they move toward Frenchman, the retreat will be continued to the bridge over the Missouri River.

The Red commander is ignorant of the strength of the Blue column (which may be the advance guard of a larger force) and his first concern is to cover the supplies in Kickapoo while reconnoitering the enemy and endeavoring to ascertain his strength and intentions. His role, at the outset, is a defensive one, and his first move will be in the direction of Plum Creek with a view to interposing between the Blues and Kickapoo. He *decides*: to send the leading squadron forward rapidly to attack the Blues; to move the other two squadrons forward rapidly (on the Millwood—A. Daniels—Kickapoo road) to Plum Creek; and to send an officer's patrol around the enemy's left flank to ascertain the strength of the column and whether or not it is followed by supporting troops. If he discovers the Blue force to be considerably smaller than his own, he will attack with his whole force, enveloping the Blues' left flank and endeavoring to cut them off from the Fort Leavenworth bridge.

MAP MANEUVER NO. 5

SITUATION,—BLUE

On October 20, a Blue detachment of all arms, in hostile territory, is moving via Leavenworth on Kickapoo, where it is to bivouac.

Its independent cavalry (one squadron with a machine gun platoon) has been directed to trot ahead and hold Kickapoo until the arrival of the detachment, reconnoitering the roads to the north and west. At 11 A. M., the main body of the cavalry ($3\frac{1}{2}$ troops) has reached Frenchman when its commander, who is at the head of the col-

umn, is informed that two small patrols of Red cavalry had been seen on the high ground about a mile to the northwest and that a cloud of dust was seen still further north which appeared to be moving eastward.

SITUATION,—RED

On October 20, a Red detachment in friendly territory is approaching Leavenworth via Lowemont and the Millwood road. Its independent cavalry (one squadron) has been sent ahead to secure the Terminal Bridge at Leavenworth. At 11 A. M., the cavalry commander, who is at the head of the main body (3 troops) is opposite Sprong on the Millwood road when he receives information that a body of Blue cavalry, estimated at 3 troops, was approaching Frenchman from the south.

Both commanders are given the information that, owing to a stock law which had been passed in Kansas making fences unnecessary, all fences had been removed except those on small enclosures near farm houses, also that all crops had been removed and that the ground was hard and dry.

MAP MANEUVER No. 6

SITUATION,—RED

On June 1st, a Red force consisting of the 1st Infantry (less 3d battalion) and Troops A and B, 1st Cavalry, is covering the removal of a quantity of supplies from a storehouse at Merritt Lake to the R.R. station at Fort Leavenworth. At 8.30 A.M. it is in position, all troops being north of Corral Creek, when information is received that Blue troops are approaching from the south and have reached Metropolitan Avenue. The removal of the supplies will be completed by 11 A. M.; they are to be sent to Atchison.

SITUATION,—BLUE

On June 1st, a Blue force from Kansas City, consisting of the 3d Infantry and 3d Squadron, 3d Cavalry, with orders to capture or prevent removal of supplies from a store house at Merritt Lake, is approaching Fort Leavenworth from the south. At 8.30 A. M. its leading element has reached Metropolitan Avenue on Broadway and information has been received that Red troops are holding the crossings of Corral Creek.

Both commanders are informed that Corral Creek can be crossed only at bridges and fords on Grant Avenue, Farragut Avenue, and the Target Range Road, and that the country west of the Leavenworth sheet of the maneuver map (600 yards west of the target range) is impassable.

MAP MANEUVER No. 7

GENERAL--SITUATION

On October 3, a Blue division is advancing via Platte City, Mo., on Fort Leavenworth. A Red division is concentrating at Atchison, Kansas. The Missouri River forms part of the boundary between the territories of the Reds and Blues. Plum Creek and Salt Creek are serious obstacles.

SPECIAL SITUATION,—BLUE

The advance guard of the Blue division has reached Platte City, Mo., and has detached the 1st Infantry, Troop A, 1st Cavalry, and Battery A, 1st Field Artillery, to occupy Fort Leavenworth and cover the crossing of the division. The leading element of the detachment has reached the west end of the bridge at 1 P. M. The remainder of the Blue advance guard is expected to begin crossing at 6 P. M.

SPECIAL SITUATION,—RED

The 3d Cavalry, with Battery F, 5th F. A. (horse), has been sent from Atchison to destroy the bridge over the Missouri River at Fort Leavenworth. At 1 P. M. the leading element of the detachment is two miles northwest of Kickapoo.

MAP MANEUVER No. 8

GENERAL SITUATION

On November 20, a Blue division is retreating thru Leavenworth towards Atchison pursued by a Red division. Salt Creek is a dry ravine.

SPECIAL SITUATION,—BLUE

The Blue rear guard, consisting of—
1st Infantry,
Battery A, 1st Field Artillery,
Troops A and B, 1st Cavalry,
One platoon of a field signal company,
has halted for the night near Burns. It is now 6 A. M. and the rear guard commander has just received orders to hold ground south of Plum Creek until noon. Cavalry patrols have been in contact with hostile cavalry on the Atchison Hill—South West Hill ridge during the night.

SPECIAL SITUATION—RED

The advance guard of the Red division consists of—
3d Infantry,
5th Infantry,
Battery B, 7th Field Artillery,
3d Squadron, 9th Cavalry,
One field company, Signal Corps,
Ambulance Company, 3d Field Hospital.
The cavalry reached Avenue Hill at dark and bivouacked there; its patrols have been in contact with hostile cavalry on the Atchi-

son Hill—South West Hill ridge during the night. The infantry and artillery of the advance guard are two miles further south. It is 6 A. M.*

*The maneuver problems may be varied by changing the strength and location of the forces.

CHAPTER V.

FIRE LOSSES

NOT COMPUTED IN MANEUVERS

Our "Provisional Instructions for Maneuvers" (1904) say (Par. 40): "By practice in calculating losses in war games on the map a certain readiness in recognizing the principal factors governing the effect of fire and consequent facility in estimating losses may be cultivated."

Losses are no longer calculated in war games. The experience of ninety years shows that it is a mistake to do so. The director can not take the time in a map maneuver to calculate losses by the aid of tables without destroying interest in the maneuver; and map maneuvers are too valuable as a means of instruction in tactics to justify making them unpopular merely for the purpose of training officers to estimate losses correctly. Besides, the delays caused by such computations prevent the exercises from being carried far enough to enable us to draw conclusions from them.

Tables of losses are not used in field maneuvers. In Colonel Wagner's report of the field maneuvers of 1903 at West Point, Kentucky, and Fort Riley, Kansas, he says: "A table of losses was carefully prepared for the use of the umpires. Such tables, while very valuable in a game of kriegsspiel, are of but little account in maneuvers in the field. * * * In most cases, the action moves so quickly that the umpire is compelled to make his decisions instantly, without time for referring to a table, and the best

that can be done is to endeavor to rectify any mistake that may thus be made when the problem is finally discussed."

It is apparent that the "kriegsspiel" here referred to is the old war game, now distinctively known as "Rigid Kriegsspiel."

The opinion of Colonel Wagner on this subject also appears in paragraph 40 of the "Provisional Instructions for Maneuvers" (1904) as follows: "At maneuvers decisions must be rendered so rapidly that there will seldom be time to make computations or to consult a table of losses."

UTILITY OF TABLES

In the revision of Meckel's "Anleitung zum Kriegsspiel" (1904) the tables of fire losses which appeared in the earlier editions of his work are omitted; in explaining the omission he says:—"The tables of fire losses, given in the first edition of this work, have been omitted here, because their use—as was known then—makes the game slow and tedious. It is believed that there are now officers in each regiment who have sufficient knowledge and good judgment to be able to estimate the effect of fire correctly."

Does any field of usefulness for the old tables of losses—upon which so much labor has been expended —still remain?

It is not doubted that we have also in each regiment officers who are able to estimate the effect of fire correctly enough for the purposes of maneuvers. But while in the German army the younger officers have frequent opportunities—at map maneuvers, tactical rides, and field maneuvers—to learn the probable effect of fire thru listening to decisions of older, more experienced and better instructed officers; our opportunities for such instruction have hitherto been limited to our field maneuvers. Many of us have formed exaggerated ideas of the effectiveness of fire

arms from our observation of the effects of firing on the target range, and some of the decisions made at field maneuvers do not help to dispel the illusion.

As a result an unreasonable timidity is sometimes noticed in our younger officers at field maneuvers,—probably greater than they would show in action. A troop commander is sometimes seen to dismount his troop to fight on foot because a hostile patrol has been seen; a company sometimes deploys and halts because it has been fired upon by two or three men.

Instruction in the probable effect of fire in action is sometimes desirable and our maneuvers (both in the field and on the map) would probably be benefitted by it. Of course, in maneuvers, the chief importance of the losses to the director lies in their indicating the probable conduct of troops which have sustained them;* but, aside from the shock action of cavalry, the most important factor influencing the conduct of troops in action is the effect of the enemy's fire on them, and it consequently becomes important to be able to determine this factor with some degree of correctness.† If such instruction cannot be given in any more satisfactory way, it is recommended that the tables of fire losses—once used in map maneuvers but now discarded—be revived and used in solving problems based on hypothetical situations, for the purpose of correcting our ideas sufficiently to enable us to estimate losses within the bounds of probability.

BASIS OF TABLE

The table attached is based on paragraph 40 of the "Provisional Instructions for Maneuvers" (1904); which appears to be based on the tables of "The American Kriegsspiel" (Livermore). The use of percent-

* The German infantry drill regulations of 1906 contemplate the representation of losses in field maneuvers in order to accustom troops to the conditions of battle.

† Officers who have the opportunity to do so are recommended to study the works of Lieut. General H. Rohne on "Infantry firing regulations", and "The effect of of infantry fire under service conditions".

ages is discarded because it has been found by an extended series of tests that it is simpler in most cases to compute the number of men disabled than to compute the percentage of the organization. It is true that the percentage is really the more significant number,—especially when taken in connection with the rough rule given in paragraph 28, "Provisional Instructions," that a loss of one third is a sufficient ground for ruling an organization out; but when the number of men disabled is determined, the percentage of loss is also known or can be readily computed.

Paragraph 40, "Provisional Instructions," has also been departed from to some extent in regard to the effect of artillery fire; the allowance at 3000 yards appeared to be insufficient in view of recent experiments, and the allowance at 1000 yards appeared to be too great; and the figures have been modified accordingly. It is hoped that data can be obtained by means of which the table can be tested and corrected to accord more perfectly with recent experience both in regard to rifle and artillery fire.

USE OF TABLE

To use the table in determining the probable effect of rifle fire, the mind is fixed upon the case of one company of 128 men—deployed and firing on another company of equal strength which is also deployed and returns the fire—for one minute—range estimated.

Other circumstances are always taken into consideration,—such as the range, rapidity of fire, position taken in firing, degree of instruction and physical condition of the troops firing, and their morale and the effect of hostile fire upon them. Circumstances relating to the troops fired on are also considered, such as the angle which their front presents to the line of fire, whether they are in motion or at rest, their formation or interval, their position (standing,

kneeling or lying), and whether or not they are under cover.

But the circumstances just named are shown in the table and it is unnecessary to burden the mind with them at the outset, tho the object of using the table is to learn, eventually, what these circumstances are and their relative importance.

What is called the "standard case" is shown in the center column of the table; and, expressed in ordinary language, its meaning is as follows;—that if a company (128 men) fires one minute on another company (128 men—who return the fire) a loss will be inflicted on the second company of 1 man; corresponding to 0 points (to be explained later); when the range is 900 yards; the first company fires six shots per man per minute; from a lying position; their instruction is average (fair); their condition is fresh (not fatigued); their morale is unshaken (good); they are sustaining a fire equal to their own: and the front of the second company makes an angle of 90° with a line thru the centers of the two companies, the second company is not in motion, is deployed with two paces interval between the men, and the men are lying down in the open without cover.

Circumstances which vary from the "standard case" are shown in other columns of the table and it will be noticed that circumstances which have the effect of increasing the rate of loss are placed in columns to the right of the center; while those which diminish the rate of loss are in the columns to the left.

The losses in cases which vary from the standard case are obtained by multiplying the loss in the standard case by a suitable multiplier (or combination of multipliers) placed in the table at the top of each column.

Since the processes of multiplication become tedious when the varying circumstances are numerous, modified logarithms or "points" are ordinarily used instead of the multipliers themselves, in order to abridge the work of computation.

These "points" are obtained by taking the common logarithms of the numbers immediately above them (the corresponding multipliers) multiplying them by 20, and rejecting the fractions. It is apparent that these "points" are not accurate, but they are sufficiently so for our present purposes.

The assumption is made that if the first company, —mentioned in the "standard case", and which for the purpose of discussion we will call Blue,—is reinforced by another company the losses of the enemy (Red) per minute will be doubled.

If the Red company is reinforced by another, which merely thickens without extending the line, it is assumed that the rate of the loss of the Reds will be doubled. (This is shown in the table by the column "Troops Fired On"—Formation—1 man per yard—Multiplier 2).

But if the second Red company prolongs the line of the first without thickening it, the assumption is that the rate of the Red loss is not changed.

Of course the moral factor is affected by reinforcements, as is shown by another part of the table, but this element is left out of consideration for the present. The length of the target should, however, be taken into consideration when it is less than $\frac{1}{10}$ of the range. In such cases it is supposed that a considerable portion of the bullets fall to the right and left of the target and a suitable diminution should be made in the estimated loss, varying directly with the range and inversely as the length of the target. This diminution is not shown by the table.

PROBLEMS

The use of the table can be shown most readily by means of examples. In those which follow, the conditions of the standard case are assumed to exist except when the contrary is stated.

Problem No. 1. Six companies (Blue) fire two minutes on four companies (Red) on the crest of a hill, which return the fire,—distance 700 yards. The Blue force marched at double time five minutes immediately before opening fire. Required,—the losses on both sides.

Solution. The disparity of force (3 to 2) is not sufficient to affect the morale of either side appreciably,—especially as the stronger force is fatigued.

The losses of the Blues are caused by the fire of four Red companies, consequently the normal loss (one man) must be multiplied by 4 (corresponding to +12 points); the fire is sustained two minutes, consequently it must be multiplied by 2 (corresponding to +6 points); and the range being 700 yards, it must be multiplied by 1.6 (corresponding to +4 points). The Blue loss then will be $1\times4\times2\times1.6=12.8$. The Red loss may be computed in a similar manner ($1\times6\times2\times1.6\times.6\times.4=4.628$).

The solution by making use of the points is easier because we add instead of multiplying and we then have no fractions to deal with. It is as follows:

BLUE LOSS		RED LOSS	
4 Red cos.	+12	6 Blue cos.	+16
2 minutes	+ 6	2 minutes	+ 6
700 yards	+ 4	700 yards	+ 4
		Fatigued	−4
		Crest	−8
Total	+22	Total	+26−12=+14
Ans. 12 men		Ans. 5 men	

If the multiplier which we wish to use is not found at the top of the table, search is made for it in the line below the table. To interpret the meaning of the results (+22 and +14) search is made for these numbers in the second and in the last lines of the table, and the corresponding multipliers (12 and 5) are used to multiply the loss in the standard case (1 man).

Problem No. 2. Three platoons of dismounted cavalry (Blue) advance by rushes over open ground from 700 to 500 yards distance against two platoons of dismounted Red cavalry firing at them from the edge of a wood—time consumed ten minutes. The Blue line of fire is at an angle of 60° with the front of the Red position. What are the losses on both sides?

Solution. A platoon of cavalry dismounted (18 men) is roughly $\frac{1}{7}$ of a company (128 men). The Blue force is taken at $\frac{3}{7}$ of a company and the Red force at $\frac{2}{7}$ of a company. The moral factor is inappreciable.

BLUE LOSS		RED. LOSS	
$\frac{2}{7}$ Red Co.	+6−17= −11	$\frac{3}{7}$ Blue Co.	+10−17= −7
10 minutes	+20	10 minutes	+20
600 yards	+6	600 yards	+6
		60°	+2
Total,	+26−11= +15	Wood	−6
Ans. 5½ (say 6) men		Total	+28−13= +15
		Ans. 6 men	

When a number is used as a divisor (as 7 is used in this case) look for the points corresponding to it and use them with a negative sign.

Problem No. 3. A company of Blue infantry in trenches is fired on 10 minutes by two companies of Red infantry at 600 yards range, and during the same time is enfiladed at 30° by a squad of (8) Red sharpshooters at

700 yards range. The Blue company returns the fire of the two Red companies, which are in front of it; but the sharpshooters are not seen and do not attract fire. What is the loss of the Blue company?

Solution.

FIRE OF 2 RED COS.		FIRE OF SHARPSHOOTERS	
2 cos.	+6	Squad $\frac{1}{16}$ co.	−24
600 yards	+6	Sharpshooters	+6
10 minutes	+20	Under no fire	+4
Trench	−12	700 yards	+4
		10 minutes	+20
Total	+32−12= +20	Angle 30°	+6
	10 men	Trench	−12
		Total	+40−36= +4
			1.6 (say 2) men.

Ans. 10+2=12 men.

Problem No. 4. A Blue company advances by rushes in skirmish line over open ground in 30 minutes from 1000 to 700 yards of 30 dismounted Red cavalrymen firing on them from the crest of a hill. What is the loss of each?

Solution. It is assumed that 1 section of the Blue company advances at a time and that 3 sections are returning the fire of the Reds.

BLUE LOSS

$\frac{30}{128}=\frac{1}{4}$ (about)		−12
30 minutes	+30	
Cav. under fire 3 times		−5
	+30	−17= +13.

Ans. 4.5 (say 5) men.

RED LOSS

$\frac{3}{4}$ co.	+10	−12
30 minutes	+30	
Crest		−8
Inf. under less than equal fire	+2	
	+42	−20 =+22.

Ans. 12 men.

It is apparent that the Reds will be driven from the hill. The decisive factor here is the superiority of fire of the Blue infantry. The effectiveness of the fire of the Reds is diminished (−5) by the fact that they are under a fire 3 times as heavy as their own, while the effectiveness of the fire of the Blues is increased (+2) by the fact that the fire directed upon them is less than their own.

Problem No. 5. A troop of Blue cavalry charges as foragers from cover at 600 yards a company of Red infantry which is deployed and firing. Does the charge succeed?

Solution. It depends on the morale of the infantry; if the infantry is surprised the loss of the cavalry will be as follows:

300 yards	+12	
Rapid fire	+ 4	
Cav. skirm'rs	+18	
Motion charge		−6
Inf. surprised		−6
	+34	−12=+22, Ans. 12 men.

But if the infantry is unshaken the loss of the cavalry is:

300 yards	+12	
Rapid fire	+ 4	
Cav. skirm'rs	+18	
Motion charge		−6
Inf. under no fire	+ 4	
	+38	−6=+32, Ans. 40 men.

In the first case the charge would probably succeed; in the latter it would probably fail.

Problem No. 6. A Blue company which has marched at double time for 3 minutes up a slope of 5° in close order and immediately deployed in skirmish line (2 paces interval) in the edge of a wood is, to its surprise, fired on by a Red company in a trench 400 yards in its front, deployed at 1 man per yard. Both companies open rapid fire. What are the losses at the end of one minute?

Solution.

BLUE		RED	
Red co. rest (trench)	+2	Fatigued	—6
Rapid fire	+4	Surprised	—4
400 yards	+10	Trench	—12
Wood	—6	400 yards	+10
		Rapid fire	+ 4
		1 man per yard	+ 6
Total	+16 —6= +10	Total	+20 —22= —2
Ans.	3 men	Ans.	.8 (say 1) man

The fatigue factor is changed from —4 as given in the table to —6 because it is thought that the marching at double time up a steep slope would have a very exhausting effect; similarly the surprise factor is changed from that given in the table because it is thought that the cover of the wood prevents any considerable confusion as a result of the unexpected fire. Factors should be used in accordance with the circumstances of the case; the table is merely a guide. Note that the negative sign of the result (—2) merely means that the multiplier is a fraction.

ARTILLERY AND MACHINE GUNS

The fire of a machine gun is taken to be equal to that of a platoon (64 men). In computing the effect of artillery fire, the case is considered of a battery of four guns, not under effective fire, using direct fire, and firing on a company (128 men) range approximately determined.

The figures given are based on the supposition that the fire of a battery at 3000 yards is about equal to that of a company (128 men) at 1000 yards; and that the effectiveness of the battery does not increase rapidly at shorter ranges.

The factor of vulnerability of artillery in action (10) is based on the supposition that the guns have no shields and that no other cover has been provided.

In the case of artillery in action protected by shields, the multiplier for "trench" (.25) should be introduced; but if the fire is at an angle of 60° or less with the front of the battery the protection of the shields is not considered.

Problem No. 7. A battery of field artillery (Red) not under effective fire and using direct fire with range approximately determined fires one minute on a battalion of Blue infantry lying in the open at 2500 yards. Required, the loss of the Blue infantry.

Solution. The only circumstance here varying from the standard is that a battalion (4 cos.) is fired on. But since nothing is said about the formation or interval, it is presumed that the battalion is in one line with the standard interval (2 paces). Increasing the length of the target is not supposed to increase the rate of loss above the standard; tho shortening the target to less than $\frac{1}{10}$ of the range would lower the rate below the standard.

The loss of the Blue infantry is estimated to be one man.

Problem No. 8. A battery fires for four minutes on two companies on the crest of a hill. The companies are deployed one man per yard and the range is 3500 yards. What is the loss of the infantry?

Solution. The length of the target is $\frac{1}{14}$ of the range and an estimated allowance of four points is made for bullets falling to the right and left of it.

4 minutes,	+12	
Crest,		−8
3500 yards,		−6
1 man per yard,	+ 6	
Target $\frac{1}{14}$ range,		−4
Total,	+18	−18 = 0, Ans. 1 man.

Problem No. 9. A battalion of infantry leaves cover and advances in line in double rank over open ground from 2100 to 2000 yards range of a hostile battery which has previously ascertained the range approximately. The infantry advances without halting or firing. The ground is of such a nature that they can march only fifty yards per minute. The battery opens fire upon them as soon as they appear. What are the losses of the infantry?

Solution. No allowance is made for the motion of the infantry—it would be less than one point and would make no appreciable difference in the result.

2000 yards	+ 2
2 minutes	+ 6
2 ranks	+16
Standing	+16
Total:	+40, Ans. 100 men

It sometimes happens that results are obtained which are not found among the "points" given in the table. It is to be remembered that these "points" are used as logarithms. A result in points not in the table can be distributed among numbers in the list of points, and the multipliers corresponding to these numbers multiplied together.

For example, suppose that we have obtained a result of +72; this is not in the table but it can be distributed as +40+32.

+40 +32= +72
100 ×40= 4000

The "points" are only approximate logarithms; when the results are large the error is sometimes considerable. To show their inaccuracy, suppose a result of +60 is obtained. If this result is distributed as +40 +20 or as +20 +20+20 the final multiplier is found to be 1000; but if it is distributed as +30+30 a multiplier of 900 is obtained.

e Losses.

	3.00	4.00	6.00	8.00	10.00	16.00	20.00
M							
P	+10	+12	+16	+18	+20	+24	+26
TROOPS FIRING — RANGE	400	300	200		100		
Troops Fired on	1 Rank		2 Ranks Standing	Cavalry skirmishers	*Artillery in action	Cavalry in line.	Artillery limbering

* Unsheltered.

Additio	7	9	11	12	13	18	24	30	40	100
Corres	+17	+19	+21	+22	+23	+25	+28	+30	+32	+40

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